40 lock C

Education special — page 15

POPULAR Computing WEEKLY

40p

10-16 May 1984 Vol 3 No 19

BRITAIN'S BEST-SELLING MICRO WEEKLY

News Desk

Advance arrives at WH Smith

ADVANCE Technology's low-cost IBM compatible computer will be available in selected WH Smith stores from Wednesday this week.

The micro — based on the 8086 processor — will be available in two forms with the basic version — the 86a — costing only £399

The 86a model offers 128K Ram (expandable to 256K), 16K video Ram, 64K Rom including Basic, and separate 84-key professional quality keyboard

Display is either 80 x 25 or 40 x 25 characters in text mode. Graphics resolution is either 320 x 200 or 640 x 200 in either 4 or 2 colours from a palette of 16 colours

Interfaces include a cassette port, joystick, light-pen and Centronics printer port. The Microsoft GW Basic used by the machine has been modified to be compatible with that used by the IBM PC. Up to 62K

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The Advance 86a costs £399, offers 128K Ram, 16K video Ram and 64K Rom

The end of the ZX Printer

SALES of the Sinclair ZX Printer are to end

Manufacture of the unit — which is compatible with the Spectrum and ZX81 computers — has already been halted and only limited stocks are still available

Sinclair's ZX Printer — only limited stocks left

Commenting on the decision to discontinue the line, a spokesman said "The product is now three years old and sales have been declining over recent months

"Now that the Interface 1 and RS232 leads are freely available for the Spectrum most people want to use a letter-quality printer."

Sinclair's decision will make it difficult for new ZX81 owners to attach a printer to their machines. Interface 1 is not compatible with the ZX81

The company has no immediate plans to either produce a new printer or to licence an existing printer from

continued over the page ▶

This Week


FROM DER LIDDLE WABBITS...
FOR THE KOMMANDANT 64
£5.99 inc.
Stalag 1
A VERY VACKY VUN!
ZIS IS YOU... OH, VOT A SCHWEIN YOU ARE!
HAPPY DOGGY SCHULTZY VILL BITE ANYZING UND ANYVUN!
DIG, DIG, BRITISH FOOLS... FOR ZEM DER WAR IS OVER - VUNCE YOU STOP ZEM!
IT'LL END IN TEARS, TEDDY!
RABBIT SOFTWARE
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10-16 May 1984 Vol 3 No 19

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Popular Computing Weekly,
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Accuracy
Popular Computing Weekly cannot accept any responsibility for any errors in programs we publish although we will always try our best to make sure programs work.

This Week

Editorial

Evangelists tend to divide people into two camps — you love them or you hate them Fans of Billy Graham will defend to the last both the style and content of his preaching, while opponents will decry his methods as being more appropriate to 'show business

The BBC tv micro programme had a strong evangelical side to it The producers and directors saw themselves as having a 'mission to explain' — they wanted to bring an awareness of micros to the masses The series was designed to show what micros could do and how they could affect our lives in the future

Despite attracting an avid audience, the BBC series met with a decidedly mixed reception Many people thought the series would teach them how to program and were disappointed to discover that this was not the case

Yorkshire Television's *Me & My Micro* series, due to begin on Sunday, June 10, takes the opposite approach It is designed to teach people the basics of programming nothing more

The Yorkshire series is still being completed, but the rough version that I saw looked simple and easy to understand though it will hold little for advanced programmers

Both approaches have their merits, but *Me & My Micro* has the advantage of knowing exactly who it is targeted for and what it should contain

Next Thursday

Vic Connection is next week s star game for the unexpanded Vic 20 by Ian Creighill — it is a version of Connect Four

Advance

◀ continued from page 1

Ram is available from Basic

The 86a is a cassette based machine and can be used with any domestic recorder. By the end of this month 20 titles should be available for the machine. WH Smith is co-ordinating development of cassette software for the machine and suppliers include Software Limited, Pete & Pam, and Softcell.

The 86b is an altogether different animal. For a start it costs £1,500. A 86a machine can be upgraded to an 86b for £1,100.

The 86b offers, in addition to the base model, memory expandable to 768K, an RS232 interface, twin 360K disc drives running MS/DOS (modified to be similar to PC DOS), an option for two more drives including a Winchester hard disc, four IBM-compatible card slots and two true 16-bit slots. The machine also comes with four Perfect disc software packages — *Perfect Writer*, *Perfect Filer*, *Perfect Speller* and *Perfect Calc*, and is supplied with 24-hour engineering support cover by NAS (part of National Semiconductor).

The Advance 86b is claimed to be highly compatible with the IBM PC and because of its 8086 processor (instead of the PC's 8088) is claimed to run up to 40 per cent faster.

The Advance machines are manufactured by Ferranti who also makes the ULA chips for the Sinclair Spectrum and ZX Microdrive.

Following delivery of the first batch of around 500 machines to WH Smith production will be increased and Advance plans to manufacture 100 000 machines before Christmas.

ZX Printer

◀ continued from page 1

another manufacturer.

The special aluminised paper used by the ZX Printer will continue to be manufacured in limited quantities.

Several hundred thousand ZX Printers have been sold since 1981.

Acorn Z80 provides the speed

ACORN'S long awaited Z80 second processor for the BBC micro is now available.

Aside from providing a significant increase in speed of program execution, the system also makes the industry standard CP/M operating system and software available to the machine.

The Z80 processor, in a separate unit, also houses the operating system for CP/M 2.2.

The unit makes 55K of memory available for software and enables task handling to be split with the Z80 running the software and the BBC's 6502 concentrating on input/output screen graphics and system routines.

Although CP/M 2.2 is considered a somewhat elderly version of the system it is becoming the standard for home micros — it's used by the Amstrad CPC464 and the Tatung Einstein (*PCW*, April 26).

Price for the processor is £299, but this figure includes three business software packages — wordprocessor, database and spreadsheet. Nucleus applications generator and the business language CIS Cobol. Two versions of Basic are also included — a 'professional' Basic and a Z80 version of BBC Basic.

You and your micro on tv

ME & My Micro is a new tv series that is designed to teach you how to program. Produced by Yorkshire Television, the series will be shown on all ITV regions on Sunday mornings from June 10.

Presenter Fred Harris explains how to create simple routines which can be combined to form basic games. Subjects covered include the use of loops, sub-routines, structured programming and the creation of simple graphics.

"The series is aimed at 12 year-olds of all ages and should not be beyond anyone who has access to a microcomputer," says producer Adam Hart-Davis. "Yet it should still have something to offer for all but the most experienced practitioners."

Each of the five programmes lasts for ½ hour and concentrates on the Spectrum and Electron micros. Listings of the programs used in the series will be available for these and other popular micros by sending details of your computer and a stamped addressed envelope to *Me & My Micro*, Admail 1, Leeds LS3 1YS.

Fred Harris, presenter of Yorkshire Television's *Me & My Micro*

Frozen megabytes

ALL this summer people will be eating Megabytes.

Wall's Ice Cream has produced two new ice lollies specially for micro enthusiasts who get hot under the collar. The confections are linked to two competitions to win Acorn Electron and BBC computers.

Time stands still

TELLING the time is almost not the main purpose of Seiko's Data-2000 wrist watch. The system consists of a watch and a pocket-size Qwerty keyboard. It can be used to calculate, retain and display data.

Up to 2,000 characters can be displayed on the liquid/crystal display screen, which is 22mm x 17mm. However, it is capable of showing memorised data on a full matrix composed of 50 x 28 pixel elements. It can also show graphics patterns.

The watch has five LSI chips including a CPU and 2K Ram

Additions to the PC Jr

DISAPPOINTING sales in the US have led IBM to consider adding additional features to its PC Jr computer. These could include an improved keyboard and a 'mouse' cursor device similar to that pioneered by Apple for its Lisa machine.

The PC Jr machine now faces strong competition from Apple's new IIc portable version of its successful IIe machine — launched at the end of April (see PCW, May 3).

The Apple IIc costs £1064 with 128K Ram and a built in single 5¼inch floppy disc drive.

Options for the machine include a monitor and stand at £192, a second disc unit at £265 and a 'mouse' cursor control device at £81.

The IIc will be available in the UK from this month. By July Apple will also offer a 80 x 24 character liquid crystal display as an option in place of the monitor. No price is yet available for this flat panel display.

QL . . . at last!

THE first QL machines have now been received by customers.

A small number of machines were dispatched from Sinclair's warehouse in Camberley late on Monday, April 30, by courier and first-class post.

However, not all customers promised machines before the end of April have so far received their machines. The remainder are expected to be sent out within 10 days.

The first machines have been sent out without a Basic programming manual. This is expected to be ready within the next week.

● *PCW*'s QL order: Week 16. It's here! Our QL arrived by post on Tuesday May 1. The machine was in good working order and was supplied with eight rather than four blank QL microdrive cartridges.

Letters

Adventure Helpline

Recently, I called on the services of *Adventure Helpline* for the first time I was amazed at the kind response Phone calls from Liverpool, Bristol and Oxford and a great batch of friendly letters

Thanks to one and all

Bill Hanna
1 Shandon Crescent
Edinburgh

Instant death

I am writing in reference to Simon Lilley s letter about *Jet Set Willy* (*PCW* Vol 3 No 16)

I noticed the same things as he did and wrote to Software Projects I got a reply stating that "Unlike *Manic Miner*, *Jet Set Willy* is a total graphics adventure, where graphics only, and not text, guide Willy round the 60 rooms but to make the adventure almost impossible is the attic

"Once you have visited the attic, your very presence there will trigger a chain reaction in the Chapel The four guardians there will go to the Kitchen, West of Kitchen, East wall base and Cuckoo's Nest making short cuts through them impossible as you will encounter instant death when entering those rooms

Alan Salmon
422 Nore Road
Portishead
Bristol

Total exasperation

No doubt all of us read many reports about computer software, mainly games, so at least we have some indication of the content But, what about adventures? We are often left to read a short note about the adventures, look at the picture, and thereafter take pot luck

We (the family and friends) have just completed an adventure called *Heroes of Khan* by Interceptor on our Commodore 64 It is an absolutely marvellous adventure the graphics and music are brilliant and the plot is first class We have had many weeks of fun and at times total exasperation with *Heroes* Anybody who does not thoroughly enjoy this adventure should switch off their computer and take up knitting.

R Parsons
1 Pallett Hill Estate
Catterick Village
Richmond
North Yorks

Our sister publication *Micro Adventurer* will provide you with plenty of in-depth adventure reviews.

Graphics designer

I would like to congratulate Mark Lawrence on his machine code routines — notably Organ Graphics Designer and Word Processor The displays in these programs are superb and he has used under 2K of machine code where it would take about 10K in Basic I hope you will print more of his work and thanks for a superb magazine

Carl Duckett
15 Wernlys Road
Pen y Fai
Bridgend
Mid Glamorgan

Character generator

I have enclosed a listing which your readers may find useful in conjunction with my character generator program published in the 19 25 April edition By adding these extra bytes, the program will provide a list of relevant numbers when you store your design

"The Walls software has melted and clogged the BBC keyboard

```
CHAR GEN LIST FACILITY

7E60 3E0F     LD   A,0F
7E62 32085C   LD   (5C08),A
7E65 E5       PUSH HL
7E66 3E02     LD   A,02
7E68 CD0110   CALL 1601
7E6B 3E16     LD   A,16
7E6D D7       RST  10
7E6E 3E04     LD   A,04
7E70 D7       RST  10
7E71 AF       XOR  A
7E72 D7       RST  10
7E73 E1       POP  HL
7E74 E5       PUSH HL
7E75 0108     LD   B,08
7E77 7E       LD   A,(HL)
7E78 E5       PUSH HL
7E79 C5       PUSH BC
7E7A F5       PUSH AF
7E7B CD2820   CALL 2028
7E7E CDE320   CALL 20E3
7E81 F1       POP  AF
7E82 FE0A     CP   0A
7E84 3003     JR   NC,7E89
7E86 3E20     LD   A,20
7E88 D7       RST  10
7E89 3E20     LD   A,20
7E8B D7       RST  10
7E8C 3E0D     LD   A,0D
7E8E D7       RST  10
7E8F C1       POP  BC
7E90 E1       POP  HL
7E91 23       INC  HL
7E92 10E3     DJNZ 7E77
7E94 E1       POP  HL
7E95 CD0B76   CALL 7B0B
7E98 C9       RET

POKE 31607,50
POKE 31608,126
```

If you have an assembler, then enter the source listing to *7E60H* (32352 decimal) *Poke* 31607,96 and *Poke* 31608,126 and then Save the complete block of code with Save "gen code" CODE 31000,1410 If you do not have an assembler, enter the hex bytes on the left of the source code, *Poke* 31607,96 and *Poke* 31608,126 and Save "gen code" CODE 31000,1410

Mark Lawrence
Essex

The final time

This is the third and final time that I am going to write to you I have had enough

Over two months ago I ordered a copy of *Eye of the Star Warrior* and I have still not received it In addition I have written half a dozen times with letters and questions for Peek and Poke, yet nothing can I see published in your magazine What is the matter?

Perhaps you did not get some of the letters, but surely you must have received a few of them? You complain about the delay on your Sinclair QL order and yet you do the same to your readers

I hope that this letter will be published as the following *Pokes* may be useful for many of your Spectrum readers *Poke 23617,236* is useful for questioned inputs because it will change the cursor to '?' *Poke 23606,8* must be used with care as it renders all program lives unreadable by scrambling the characters However *Poke 23606,0* will reverse this

Poke 23756,0 will make the first line of a Basic program become line 0 This line cannot be removed or edited

By a simple *Poke* the Spectrum can have a program removed and recalled again It is *Poke 23755 100* which acts like *New* on the BBC micro The program can then be recalled by *Poke 23755,0* as with *Old*

It is sometimes useful to be able to set the Spectrum into the *Caps Lock* mode This can be done by *Poke 23658,8* and can be reversed by *Poke 23658,0* Also, *Let Cap=Usr 4317* changes Caps to lower case and vice-versa

Decimal equivalents of any binary numbers can be printed on the screen by *Print Bin 010* The address of free Ram can be printed as well with *Print Usr 7962*

I hope your readers (and yourself) will find these *Pokes* and routines useful

Fraser Davies
41 Four Oaks Common Road
Four Oaks
Sutton Coldfield
West Midlands

Thank you for the *Pokes* which I am sure our readers will find interesting.

I was most distressed to learn that you still have not received your *Eye of the Star Warrior* tape. Everybody should have received their tapes weeks ago Anyway, a tape will be dispatched to you immediately

As to the non-appearance of your letters and queries, I am afraid that we can only print a selection from the hundreds that pour into the office each week However, we do try and pick letters that are interesting and useful for a large number of people


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ARCADE ACTION
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Othello

A new game for 16/48K Spectrum by Paul Reynolds

This program is a game of strategy and uses a fair blend of Basic and Machine-code which makes the response of the computer reasonably fast. There are 10 levels of play.

The idea of the game is to try and occupy as many squares of the board with your colour (Cyan and yellow flashing) as possible. Any of the computer's pieces which lie in a straight line between the last piece the player placed and any other of the player's pieces, are automatically 'captured'.

Program Notes

20 — 190	Set up the screen and variables.
200 — 240	The play loop
290 — 380	Remark on who won the game
1000 — 1210	Calculate the computer's move
1500 — 1820	Enter and make the player's move
9000 — 9030	Machine-code loader
9100 — 9280	The Machine-code (in hex form)
9900	Save program with auto-run on loading.
USR 32256	Calculate the points gained for a certain move.
USR 32416	Calculate the possible No. of moves that can be made

Addresses

32334	=0 to take a certain move =2201 to test a certain move
32761	position of move (8*(Y 1)+X 1 X and Y range from 1 to 8)
32762	=1 if the Computer is moving =2 if the Player is moving

Note: Do not run the program until it is complete and saved on tape. To save the program type *RUN 9900* (ENTER) To test the program type *RUN 9000*



```
  0 REM

 ****************************
 *                          *
 * OTHELLO by Paul Reynolds *
 *                          *
 ****************************

 10 DEF FN A(E)=CODE A$(E)-48-7*(A$(E)>"9")
 20 CLS : PRINT "      OTHELLO by Paul Reynolds"
 30 PRINT AT 7,11; PAPER 2;"12345678"
 40 FOR A=1 TO 8
 50 PRINT TAB 11; PAPER 2;A; PAPER 1,TAB 20; PAPER 2;A
 60 NEXT A
 70 PRINT TAB 11; PAPER 2;"12345678"
 80 INPUT "LEVEL OF PLAY (0 TO 9)";L
 90 IF L<0 OR L>9 THEN GO TO 80
 150 PRINT AT 0,0;"LEVEL ";L;TAB 9;"YOUR SCORE 0   MINE 2"
 160 POKE 22895,38: LET L=L*10
1130 LET B=B+1: RETURN
1200 PRINT #0; PAPER 1;"I CANNOT MOVE": BEEP .5,-10
1220 PAUSE 100: RETURN
1500 LET RD=RD+1
1510 IF NOT USR 32416 THEN GO TO 1500
1540 PRINT #0; PAPER 1;"YOUR MOVE (NO. ";RD;")"
1555 PRINT #0; PAPER 1;"ENTER THE CO-ORD, PRESS 1 - 8"
1560 GO SUB 1710: LET B=I
1610 PRINT AT 6+I,10;" ";AT 6+I,21;" ";#0; PAPER 1;AT 3,10;"<"
1620 GO SUB 1710: LET M=...+I
1630 PRINT AT 6+B,10;" ";AT 6+B,21;" "
1632 GO SUB 1100: IF I=0 THEN INPUT ;: PRINT #0; PAPER 2;"BAD LAST MOVE": GO TO 1550
1640 LET U=U+M+1: LET C=C-M
1650 RETURN
1700 BEEP .25,0
1710 LET I=CODE INKEY$
1720 IF NOT I THEN GO TO 1710
1730 LET I=I-49
1740 IF I<0 THEN GO TO 1700
1750 IF I>7 THEN GO TO 1700
1760 BEEP .1,10
1770 IF INKEY$="" THEN RETURN
1780 GO TO 1770
1900 PRINT #0; PAPER 2;"YOU CANNOT MOVE"
1910 BEEP .5,-10: PAUSE 100
1920 RETURN
9000 PAPER 0: INK 7: BORDER 0: CLEAR 32000: PRINT "PLEASE WAIT"
9010 READ A$: IF A$="" THEN RUN
9020 LET A=FN A(1)*4096+FN A(2)*256+FN A(3)*16+FN A(4): LET A$=A$(5 TO )
9030 FOR B=1 TO LEN A$ STEP 2: POKE A,FN A(B)*16+FN A(B+1): LET A=A+1: NEXT B: GO TO 9010
9120 DATA "7E0097C2187C32F27FDD21E07F0600C8CD307EC1DD2310F7210000...0021F...F3428...E4FC9"
9110 DATA "7E300E00CD607E75FE0EC004CD...07E1...1A5E28F7181A0ECD21F07F763DC58E77C9CD607E7710FAC0807E2...21...7E321A...EC9"
9120 DATA "7E60...53AF97F0F0F0FE6...7...C56F2...0229292...29293AF97FE607C60C256FDD5E00DD5600804100
11910FD...AFA7FC6EF5F167F1AC1C9"
9230 DATA "...EA021F97F01004071C5C D00...EC1A728010C10F5237...3..."
9280 DATA "7FE00121201FFFDFE0E1000000000FFFFFFFF28AE26AE",""

9900 SAVE "OTHELLO" LINE 9000

 170 POKE 22596,...: LET C=2
 180 POKE 22927,...: LET U=2
 190 POKE 22926,38: LET RD=0
 200 LET B=0: FOR A=1 TO 2
 210 POKE 32762,A: PRINT AT 0,20;U;AT 0,29;C
 222 POKE 32234,201: INPUT ;
 230 GO SUB 500*(A+1)
 240 IF C+U<64 AND C*U THEN NEXT A: IF B...2 THEN GO TO 200
 290 LET A$="NEITHER OF US CAN MOVE"+CHR$ 13+CHR$ 13+"SO ...": AND NOT B
 300 IF U<C THEN LET A$=A$+"SORRY AND ...  I WIN"
 310 IF U=C THEN LET A$=A$+("A" AND B)+"... TIE"
 320 IF U>C THEN LET A$=A$+("OK" AND B)+"  YOU WIN"
 330 INPUT ;: PRINT AT 0,20;U;AT 0,29;C;: INK 6;A$;#0;"ANOTHER GO ? (Y OR N)"
 340 POKE 23658,8: FOR A=0 TO 20 STEP 4: BEEP .1,10+A: BEEP .1,5: BEEP .1,10+A: NEXT A
 350 IF INKEY$="Y" THEN RUN
 360 IF INKEY$<>"N" THEN GO TO 350
 370 CLS : PRINT "OK ... BYE"
 380 BEEP 3,-9: NEW
1000 LET G=USR 32416/99: IF NOT G THEN GO TO 1200
1010 LET T=0: PRINT #0; PAPER 1;"MY MOVE - PLEASE WAIT"
1020 DIM M(2): FOR S=0 TO 63
1030 LET M=USR 32256
1040 IF M>=M(1) AND L AND RND-G*T*.05 THEN LET M(1)=M: LET M(2)=S
1050 NEXT S: IF NOT M(1) THEN PRINT #0;AT 3,0;"THIS IS A TRICKY ONE ";"+'!!!!!"( TO T): LET T=T+1: POKE 32761,5: GO TO 1020
1060 LET M=M(2): GO SUB 1100
1070 LET C=C+M+1: LET U=U-M
1080 RETURN
1100 POKE 32234,0: BEEP .1,30
1110 POKE 32761,M: BEEP .1,0
1120 LET M=USR 32256: BEEP .1,30
```

Top of the league

Christine Erskine talks to Kevin Toms of Addictive Games

The growth of the home computer industry could not have come at a better time for Kevin Toms of Addictive Games. It enabled him to turn his lifelong hobby — football — into a flourishing business

Kevin spent a considerable part of his adolescence inventing role-playing board games not so much of the D&D type, but involving simulations of real-life activities

When he left school he unsuccessfully applied to Waddington with a view to joining as a games designer Instead he ended up as a computer programmer

After the arrival of the ZX81 he began to consider the possibilities of writing the role-playing games for the micro A keen footballer who had played in local leagues, soccer seemed an obvious subject for such a game and *Football Manager* began to take shape

Kevin spent over a year writing and refining *Football Manager* and in January 1982 began advertising the program in computer magazines

"This was at a time when *Space Invaders* and its variants were about the only things on the market he said "*Football Manager* was something entirely different."

"I also spotted an advertisement for one of the early ZX Microfairs and booked a stand to give it a bit of extra publicity, which helped "

Spurred on by the success of the game, Kevin left his full-time job six months after *Football Manager* was launched and set up Addictive Games in Milton Keynes

"The appearance of the Spectrum hit our sales considerably but once we'd made a version for the new machine, things looked up again

"With the Spectrum, we were able to add to the game with colour and graphics showing the actual playing of the matches And it continued to sell and sell We must be the only software house that has grown entirely around one game "

For those readers who haven't come across *Football Manager*, the player takes on the role of manager of a lowly fourth division club — which can be any team you please, from Manchester United to Enfield Town But, even if you are Joe Fagan your side will still start at the bottom of Division Four

Your job is to guide your team to the League Championship and through the F A Cup making the most of your players with the highest skill rating (for some reason, 'G Hoddle and 'K Keegan' have a skill rating of only one out of five) and buying and selling judiciously on the transfer market

Buying players depends on your financial status, and you have your weekly wage bill and ground rent eating away at the accounts Winning matches depends on your team s skill level in attack, midfield and defence and the side s overall energy and morale in relation to that of your opponents

The game s credibility as a representation of the soccer manager s lot is strengthened by the fact that Bill Nicholson — of Tottenham Hotspur fame — is an enthusiastic player

However, Addictive Games does not intend to continue as Addictive Game for much longer Kevin has plans for diversification

"When we started out the company staff consisted of myself and my wife We were so busy just with *Football Manager* that we had no time to work on other games Since we moved to Bournemouth — I come from Torbay myself and I wanted to be by the sea again — I've taken on three full time programmers, and three people to work on the sales and administration side So now I can concentrate on designing new games

"There are several games we re working on as follow ups to *Football Manager* they are all strategy-simulation games that involve role-playing, but I ve moved away from anything sport orientated

"I could quite easily have continued the same theme and churned out *Rugby Manager Cricket Manager* and so on, but quite honestly I d have found that rather boring "

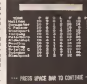
Another side of Addictive Games that is expanding is the publication of games sent in to Kevin by programming hopefuls

"We ve got five new games coming out in six weeks or so, under the label Silicon Joy, to keep them separate from the Addictive Games role-playing projects

"Four of the Silicon Joy tapes will be for Spectrum, one for Atari All are arcade style games — though with a strategy element The fifth is a program to help people calculate league tables for sports teams, which we were asked to write

"Then there are still plenty of conversions of *Football Manager* to do yet A version for the BBC is ready to come out, and one for Commodore 64 will be available very soon An Oric implementation is currently under development Then there s the Vic 20 Atari Electron the list is endless

"Now that we re expanding our aim is obviously to produce consistently good games with the proviso that they must be the type of games that I like For instance I m not interested in doing anything educational because I want to entertain people Nor am I interested in space and alien scenarios.

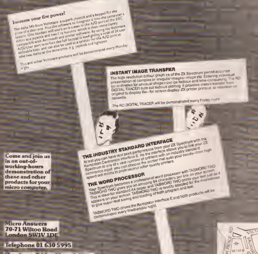


"I like games that are intellectually stimulating rather than simply relying on dexterity with the joystick — and especially games that simulate real-life, which give people the chance to do something that they wouldn't otherwise be able to do

"Interactive games are particularly interesting where players are able to almost literally stab each other in the back during the course of the game Once enough micro owners have networking equipment that would certainly be something I'd like to develop "

It is quite probable, however that whatever Kevin Toms and Addictive Games decide to go on to do his name will always be linked with *Football Manager* It has brought him considerable "cult" fame in the micro world Requests for autographs and signed photos appear regularly in the mail that arrives at the office

MICRO ANSWERS DEMONSTRATIONS



Sound and vision

***Lollita Taylor** looks at Spectrum programs for an older age range*

More than a year after its launch, the Spectrum can finally be said to have a reasonable range of educational software. The time it has taken for this to be achieved tends to prove what earnest parents feared all along — that somehow playing games always seems to have greater immediate appeal than learning.

Gruneberg has done a great PR job in marketing its packages for various languages including French, German, and Spanish, for every home micro with 48K.

The Gruneberg Linkword language System claims to be a system for teaching foreign languages which is much faster and easier than normal methods, giving the student a vocabulary of more than 350 words (400 in the case of Spanish) as well as a basic grammar in ten hours. One of the ways in which the system works is to use visual images: an English word is linked to another English word which sounds like the word in the target language. For example, the French for *tablecloth* is *nappe*, and the visual link instruction for this is, 'Imagine having a *nap* on a *tablecloth*'.

Ridiculous as it may sound to those brought up on the traditional Monday morning vocab test, it actually works! Indeed, the more absurd the visual image, the more effective the system, it appears. The program does stress, however the importance of concentrating on the visual image, and whilst the connection made between some words may seem tenuous and unhelpful — the image of tipping rubbish over my carpet certainly did not make me think of *teppich* (the German for *carpet*) — I was quite frankly astounded at how effective this visual imagery was as an aid to memory retention.

Inevitably, in a language tuition pack of this size — the pack includes a program cassette divided into 10 sections, an audio tape for use in conjunction with the program as a pronunciation guide, and a booklet containing a glossary — there will be large gaps in the student's vocabulary and grammar, but by following the course, the basics are covered. If the sentences formed sound odd in the extreme — *el gusano esta fresco* (the worm is fresh) — it is to avoid falling into the trap of learning everything parrot-fashion.

In view of the emphasis placed on the visual aspect of word association, it is a pity that the programs do not offer some sort of visual representation of the link instruction.

Similar, in that it is entirely textual, but different in that it makes no attempt to teach fresh material, is the *Calpac Chemistry Series*, for O level revision. Since it does not teach but revises what is supposedly already learnt, the program is representative of a whole range of tapes which are basically only the hi-tech equivalents of all those slim volumes of 'notes' produced by book publishers for the nervous teenager taking exams.

There are two ways of using the program, as a series of simple questions and answers, each followed by an explanation, or as a test — all the answers can be expressed by yes or no.

Calpac is unexciting but thorough and I would certainly find it helpful if I were taking the exam. The big question about this and the dozens of similar programs is, why not just use a book?

Back to programs that aim to impart knowledge rather than simply to test it with a number of packages issued by Sinclair themselves, all written by a company called Incognito software.

These use lots of sound and graphics and concern themselves with chess, music and computers. The worst first.

Musicmaster is half tutor, half music utility. As a utility it allows you to do much the same as a number of other music utilities already available — most notably *Music Maker* by Bellflower Software — create, edit, store and play tunes using graphically represented manuscript music paper.

As such it is fine, but more expensive than Bellflower's offering. As a tutor it covers the basic ground of note values, time signatures and keys signatures but the explanations are patchy. The Tone/Semitone arrangement of Western scales is taken as a *fait accompli* and as such could confuse people with no previous knowledge.

Beyond Basic and *Make a Chip* both deal with computers, more precisely, with microchips. *Beyond Basic* is an introduction to Assembly language and God knows I need one — those hieroglyphics have had me beaten for ages.

What the program does is explain graphically exactly what each Assembly language instruction means. It helps — a bit. So when you get to *Ld A, (255)* you see the number floating across from where it's stored in memory to the box that is the register, and so on for every instruction the Z80 has.

After this you can write your own routines watching what happens to the different registers as the processor acts on each instruction. A very useful program although I must admit I still don't know why *Lding A* and *Adding* the contents of 23000 etc, makes aliens move across the screen.

Make a Chip moves down a level beyond this into the realms of the building blocks that make up the chip itself — the various gates performing yes and no operations of currents.

Chess Tutor 1 is the final package here and surprisingly, it's possibly the only program covering this seemingly obvious choice of subject, ie, teaching chess.

Using a graphic chessboard and by flashing and moving the appropriate pieces this program covers basic moves, check and checkmate, stalemate, castling and rudimentary forms of attack strategy.

Each section is tested using a number of examples which are clearly explained whether you get it right or not.

Supplier	**Programs**	**Age**	**Price**
Silversoft Ltd London House 271/273 King St London W6 9LZ	*Linkword French* *Linkword German* *Linkword Spanish*	12+ 12+ 12+	£12.95 £12.95 £12.95
Calpac Computer Software 108 Hermitage Woods Crescent St Johns, Woking Surrey	*Chemistry Series — O Level*	15-16	£7.50
Sinclair Research Ltd 25 Willis Road Cambridge CB1 2AQ	*Musicmaster* *Beyond Basic* *Make-a-Chip* *Chess Tutor 1*	general general general general	£9.95 £9.95 £9.95 £9.95

This week we continue with Spectrum programs for the very young as well as some for an older age range. Also a selection for primary schoolchildren on the BBC

Plain English

Gevin Monk *dips into a mixed bag on the Spectrum*

Over the last couple of months or so quite a large number of educational programs have emerged for the Spectrum All the programs reviewed here are aimed at teaching the basic aspects of the English language

Blackboard Software has released a number of educational programs which are being marketed by Sinclair Research Ltd

The actual cassettes have no program names printed on them, instead they are marked with a number/letter code This means that it is extremely easy to get the cassettes and their appropriate boxes muddled up, if two or more programs are owned This could be even more of a problem if the programs are to be used as educational aids in schools! Each program is written in Basic with a 512 byte machine code routine which allows double size printing of characters on the screen

Castle Spellerous is a spelling game and in my opinion is the best program reviewed here The object of the game is to rescue a captured princess from a magician s castle This is performed by the correct spelling of words, which are first printed on the screen for approximately one second Instructions telling how to adjust this time are given on the inlay card The program contains a very varied vocabulary of 400 words, which are available via ten different levels Each level deals with a particular type of word such as words with "ing" endings or containing "qu"

Level ten is marked "Very hard words indeed" and quite a few of them had me stumped for a minute For every correct answer given part of a tower (which will be used to rescue the princess) is built.

The next three programs, *Capital Letters The Apostrophe* and *Early Punctuation* are all very similar Each contains twenty sentences with a single error in each one The pupil has to correct the error by moving or stopping a cursor above the error I did not feel that this was very educational and would have liked to have seen more options on these programs for example, the correction of more than one error per sentence and the removal as well as insertion of punctuation marks Each program gives an example of the possible uses of the type of punctuation being tested After ten correct answers have been given a game can be played, called *Falling Apples The Grub Game*, and *The Bottle Game* respectively These are all very simple and just really teach the pupil to find the required keys on the keyboard Due to the number of common points in these three programs, I feel that they should have been written as a single program or at least all sold on a single cassette

Speech Marks is also similar to the three previous programs By using the cursor keys the pupil has to insert quotation marks into a sentence The program has a vocabulary of 30 sentences ten for each of the three levels Once the pupil has completed five questions from each level he is allowed to play a game called *Max meets the Blue Persions* The object of *Max* is to escape from a maze in which blue cats appear at random This program was generally very good except for a rather sluggish keyboard response when inserting the quotes

The last program by Blackboard is titled *Alphabet Games* This cassette contains a single program which is divided into three games These games are supposed to teach the alphabet However, I feel only one game really succeeds in doing this The first two are *Random Rats* and *Invaders* These just teach the position and layout of the keys on the keyboard as random keys need to be pressed to control the games The third is *Alphagaps* and the user has to (as the name suggests) fill in gaps in the alphabet

Reading Aids 1 & 2 from Nisbet Educational Software come in some very attractive packing This consists of an instruction booklet and two cassettes in a video cassette type case

All of the programs print a sentence with one or more missing words on the screen, below which several words are printed The pupil has to type in the missing word(s) from those on the screen When this has been selected the word(s) selected scroll across the screen and fall into the gap in the sentence If the correct word(s) are chosen then a large red tick is drawn and the next question appears If an incorrect answer is entered then the word(s) just fall straight through the sentence and the message "try again" is printed After ten questions have been answered a goodbye message is printed and the screen is filled with a coloured pattern If the teacher then presses *O* an options page appears and the teacher can analyse the pupils results These results can, if required be copied to the printer for future use *Reading Aid 1* tests Miscue Analysis which is the reversal of words like 'on'no and 'was he re was' *Reading Aid 1* tests the Close Procedure which is the decoding and prediction skills necessary in the reading process Examples of these are colour selection and word form ie stand.standing stood The programs are not break proof but they can not be listed or changed

The main difference between the two company s programs is that the Nisbet ones are straight teaching aids designed for use in schools, whereas the Blackboard ones are suitable for both home and school use The Nisbet programs could make more use of colour sound and animation all of which are used by Blackboard Also no games appear in Nisbet s programs — in fact no reward is given at all

The quality of educational software, as this review shows is very varied and even programs by the same company can differ greatly in quality and content.

Supplier	Programs	Age	Price	Value (0-10)
Sinclair Research Ltd	*Castle Spellerous*	8-11	£7 95	9
(for Blackboard Software)	*Capital Letters*	8-11	£7 95	5
25 Willis Road	*The Apostrophe*	8-11	£7 95	8
Cambridge	*Early Punctuation*	8-11	£7 95	3
CB1 2AQ	*Speech Marks*	8-11	£7 95	8
	Alphabet Games	up to 8	£7 95	4
Nisbet Educational Software	*Reading Aids 1 and 2*	primary	£17 19	2
Digswell Place			each	
Welwyn				
Herts				

Time and motion

***John Scriven** reviews software for the BBC*

The programs reviewed here are all for the BBC machine, the most popular micro in both primary and secondary schools in Britain

At last the message seems to be getting through that educational programs do not have to be boring In fact, children are far more likely to learn if they find something interesting than if it's the same old diet merely using the computer screen for display

One area of early learning that always creates problems is that of telling the time In spite of the number of digital watches, it is still necessary to be able to tell the time by means of traditional hands on a clockface

Timeman One from Bourne Educational Services attempts to tackle this problem and states its aims clearly in the accompanying booklet. The program is "intended as a supplement to existing teaching methods using the motivational aspects of the microcomputer to encourage practice and so achieve the required skills" The program is not then intended to teach the time but to reinforce these skills — a necessary aspect of any learning

The screen shows a clock, the time in figures and words and a yellow face On a correct response the face smiles and a small figure climbs a ladder on the right of the screen If the response is incorrect the figure drops a rung Eventually the figure either falls off the bottom or plants a flag at the top Although in concept it is a good program it does have one drawback If the clock shows a quarter to five, you have to enter 45 minutes past four — a strange way to tell the time

Although most children nowadays encounter computers at an early age there are fewer programs available for this age range One company that has attempted to fill this gap is Opalsoft *Alphabet* comes complete with a little booklet that shows all the letters and the pictures that complement them A picture appears along with a choice of letters The cursor keys are used to move a pointer to the starting letter of the picture. If it's correct, the reward routine consists of a little cartoon sequence, complete with sound effects, eg, if you enter F for fire-engine, a siren sounds and the ladder extends while a little fireman ascends to the top Lots of positive reinforcement and an ideal program for the pre-school age group

Acornsoft themselves have a wide range of educational programs Some of them have been available for eighteen months and are showing their age somewhat but their new catalogue contains fresh titles, nearly all of them in the drill category *Word Sequencing* (ages 5 8 years) actually contains three programs, although the structure of each is almost identical In *Proverbs and Sentences*, some words appear on the screen in wrong order, eg

doctor An day a keeps apple away the"

Using the arrow keys to control a cursor, and two of the function keys to do the moving, the words have to be rearranged to form a well-known phrase or saying When you think it's correct, a press on the full stop key will check it for you In *Rhymes*, the lines of a nursery rhyme appear in different order, but the object and method are the same

Wee Willie Winkie

Arrange this rhyme correctly :-

Upstairs and downstairs in his nightgown,

=> Rapping at the window, crying through the lock.

'Are the children in their beds,

Wee Willie Winkie runs through the town,

For now it's eight o'clock ?'

Cursor up and down keys move the arrow

The red keys f0,f1 move a sentence

Sentence Sequencing (7-9 years) is practically identical to Word Sequencing, but shows sentences that have a logical order eg

Growing Cress
Sell the crop
Prepare the soil
Harvest the crop
Water as necessary
Plant the seeds

The sentences have to be put in the correct order in a limited time Although similar to the last program, this program requires a greater understanding of the text to achieve success

Word Hunt (all ages), contains four programs, each differing only in the words held as data It's not a long program, and I would have thought a better way would have been to load the words in from data files, which could be set up by the teacher The display shows a word, such as 'Abroad' and 'Foreign', and the child has a limited amount of time in which to enter shorter words that can be made from the target word

Missing Signs contains three similar programs The first, *Signs* displays a sum with the signs missing the child has to enter the sign that will correctly complete the number sentence, and the program fills in the sign if two incorrect responses are made The other two programs contain addition/subtraction or multiplication/division problems with missing +, -, or = signs

6 + 7 ? 14 − 9

Number Balance contains two varieties Add/Subtract and Multiply/Divide The display shows a graphic "number balance", a weighing machine with equations on both sides One of the numbers is missing, and has to be input by the child If the number is correct, the balance arm swings until it is horizontal Incorrect responses produce a swing to one side or the other.

A selection of educational programs have been available for some time from A.S.K. (Applied Systems Knowledge Ltd), and they are now appearing with the Acornsoft Logo on their boxes It is clear that these programs have been developed with a considerable amount of care to make them a complete package They are all written using machine code and are as professional in appearance as any arcade game, a fact that would not escape the notice of children

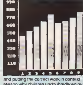
Table Adventures contains a menu, and four mini programs *Rainbow's End, Shooting the Rapids Underground Escape* and *Number Families Rainbow's End* shows a wall of bricks, and after choosing a table between two and 10 you have to say how many jumps are necessary to reach the end of the rainbow eg in the six times table, you need eight jumps to reach 48 A little creature appears and attempts to steal your gold If you've entered the incorrect answer, he takes it, otherwise you keep it After five correct answers, a large pile of gold appears and you can play another game

Children from Space is an original approach to learning English grammar Two children Beng and Zoma, need some help in learning awkward spellings, using past tenses sorting out jumbled sentences

continued over the page ▸



Education special



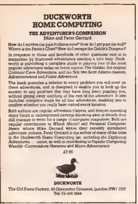
and putting the correct work in context. The reason why children undoubtedly enjoy this program is that it is presented in the form of a game. The possible disadvantage is that they may tire of it earlier, but that doesn't seem to have been the case with the children whom I have seen using this program.

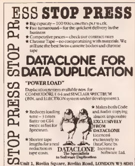
Garland Computing of Plymouth supply a range of cassettes for both primary and secondary age-ranges, and those aimed at younger children are all reasonably priced at £7. *Symmetry* contains four programs that involve drawing patterns that are symmetrical in some way, or in setting arrows to point at the correct axes.

Motion Geometry involves the concepts of reflection, translation, rotation and enlargements and contains three separate programs.

Elementary Statistics contains three programs to display information in the form of graphs. *Barchart* is a universal bar graph drawer, and requires the axes to be labelled. Unfortunately you can only enter up to 10 groups of data, which means that graphs comparing monthly information won't fit in, but otherwise it's a useful program. *Piechart* is similar, but plots a piechart with up to six slices shown in different colours. *Scatter* compares two sets of readings on a scattergram and shows how closely related they are.

Supplier	Program	Age	Price
A S K London Hse 68 Upper Richmond Rd London SW15	*Table Adventures* *Children from Space*	6-11 6-11	£9.95 £9.95
Acornsoft 4a Market Hall Cambridge CB2 3NJ	*Word Sequencing* *Word Hunt* *Sentence Sequencing* *Number Balance* *Missing Signs*	5-8 general 7-9 5-6 5-10	£11.90 £11.90 £11.90 £11.90 £11.90
Garland Computing 35 Dean Hill Plymouth PL9 9AF	*Symmetry* *Motion Geometry* *Elementary Statistics*	primary primary primary	£7.00 £7.00 £7.00
Bourne Educational Software Bedfield Lane Headbourne Worthy Winchester S023 7SQ	*Timeman 1*	4-8	£9.97
Opalsoft 112 Arterial Rd Eastwood Leigh-on-Sea Essex SS9 4DG	*Alphabet*	pre-school	£6.95


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How do I survive the pale bulbous eyes? How do I get past the troll? Where is the Pirate's Chest? How do I escape the Goblin's Dungeon?
In response to these and hundreds of other questions sent in to magazines by frustrated adventurers needing a little help Duckworth is publishing a complete guide to playing four of the most popular adventures today on home micros: The Hobbit, the original Colossal Cave Adventure, and the first two Scott Adams classics, Adventureland and Pirate Adventure
The book provides a solution to every problem you will meet on these adventures, and is designed to enable you to look up the answer to any problem that may have long been puzzling you, without giving away anything of the rest of the adventure. It also includes complete maps for all four adventures, enabling you to confirm whether you really have visited every location.
Both authors are regular adventure players, and despite spending many hours in underground caverns throwing axes at dwarfs they still manage to write for a range of computer magazines. Both are regular contributors to Which Micro? and Personal Computer News where Mike Gerrard writes their recently introduced adventure column. Peter Gerrard is the author of many of the titles in the Duckworth Home Computing list, including the Exploring Adventures series, as well as contributing to Popular Computing Weekly, Commodore Horizons and Micro Adventurers
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A souped-up tape recorder?

Engage any seasoned Oric 1 owner, myself for example, on the topic of the machine's little eccentricities and, somewhere near the top of a very long list, is likely to come the matter of the Oric's notorious tendency to resist all efforts to load software into it. That, in fact, was one of the principal reasons why, after a few months of dogged effort on my part to show who was boss I finally acknowledged defeat late last year, since when the Oric has been a permanent resident in an unused desk drawer

So, the arrival of the "new" Oric Atmos was of considerable interest Even more intriguing was the promise of disc drives for the revamped machine, a development which might, at long last, lend some real credence to the claim that this was a contender for "serious" computing In fact, the drives are also marketed for the Oric 1, but the micro may need to be appropriately modified

The system uses the 3-inch Hitachi microdiscs which have the advantage of being compact and all but indestructable, although most 5¼ inch floppy drives could be connected to the machine Power-up gives a screen prompt to insert the systems disc and, once the Disc Operating System (DOS) is booted, you have the choice of help screens, a rapid demonstration, or getting on with using the 37,631 bytes left free There are 17 DOS commands, each identified with a prefix of "!", and provisions are included for such niceties as wildcards in filenames Each "master" drive identifiable by having a red reset button at the rear can have up to four "slaves" connected to it

The most obvious drawback is the lack of the ability to get random access to any part of the disc The system for which Oric has opted is identical to that involved when using a cassette, with the read/write head having to move through sectors in sequence That doesn't matter too much where the disc contains a few long games programs, such as those included with the review copy They loaded fast and properly every time But it does make a noticeable difference when, using the Tansoft *Author* word processor for example, you build up a number of fairly short files such as letters

Oric explain that they will be utilising random access in the DOS for the same drive when it is used with the proposed "business micro due later this year", and that the existing DOS was considered best suited to the home market If it wasn't for the fact that the Bytedrive 500 for the Oric and Atmos is already available, with a hybrid cable which also repairs some of the gaps in the Basic that argument might carry more weight The question now is, if disc software does become more available, which system will the software houses opt for

The new drive is a massive improvement, in terms of speed and reliability, on cassette — it leaves more memory free than the Bytedrive and it will be compatible with the next stage Oric micro But it is the more limited of the two and anyone who is willing to lay out £270 on disc storage for a £170 micro may well want more than a drive which thinks it's a souped-up tape recorder

Barbara Conway

Turbo

When we were young a turbo was the adult equivalent of "go-faster-stripes" We stuck stripes on our buggies, they fitted odd bumps onto the bonnets of their cars

Nicholas Lloyds *Turbo* from Salamander is intended to add zip to Basic programs With Basic each command is taken by the computer and converted to machine-code — executed, and then converted back to display the result. Even with the Beeb's speed this can slow down programs — particularly arcade-type games *Turbo* takes your Basic and converts it once and for all into machine code which yo can then save and use directly It cuts out the middle man

Turbo uses only 2K of memory and does not have to be present once its work is done True — it has limitations *Turbo* requires each line to be just one Basic statement It can only handle line numbers from 0 to 255 (the Beeb's command *Renumber* 1,1 makes that easy) but long programs may need to *Turbo*-charge sub routines separately Apart from line numbers and Mode numbers *Turbo* requires everything in hex *Turbo* assumes all numbers are positive — so to tackle negative ones the helpful manual points out "you must take the complement (subtract from &FF and add 1)"

So what about limits on the Basic it will accept? It copes with many of the common keywords but not such fundamentals of BBC Basic as *Eval*, *Pi*, *Proc*, *Rnd* and the trignometric functions Luckily, it can handle *Vdu* commands and they can be used for all sorts of purposes in the Beeb The *Turbo* manual lists all the Basic keywords and in many cases shows how to achieve the same result using terms *Turbo* can cope with Some of these are quite complicated to use Tackling arrays and reading data generally means setting things up in Basic and then checking out the appropriate memory locations — not easy

If you write your own programs then you can design them round *Turbo*'s powers to make the most of its undeniable speed enhancement — around 10 to 15 times faster in our simple tests

The main snag is that writing for *Turbo* is not a whole lot easier than writing in machine-code Though the manual claims it is an intermediate stage between Basic and machine-code we reckon you would need to know a fair bit about m/c before tackling *Turbo*

If it is crucial to you to get extra speed you may be willing to tackle the business of using *Turbo*

But it isn't as straightforward in use as would first appear

Dave and Jan Watterson
Program *Turbo* **Price** £9 95
Micro BBC/Electron **Supplier** Salamander, 17 Norfolk Road, Brighton, East Sussex

Millionaire

The object of the latest release from Incentive Software is obvious from its less than original title *Millionaire* to make a million

The means by which you are to make this money is by running a software house

This seemed an appealing plot and so I settled down ready for a good game It did not materialise The program consists of a series of graphics screen displays which wait for you to press a key to decide on the various aspects of running a software house These are almost unbelievably naive, and your choices are far too lim-

ited Some aspects of managing such a company are interesting — choosing a name for example, or setting the price of your programs Every year there is the chance for you to give ratings to a few elements of a program, and this has some bearing on subsequent sales

To me the features to choose from didn't seem perticularly relevant And in the end I began to feel the same way about the whole exercise Especially since your values are checked against a 'master set' chosen by Incentive, who have at some point obviously decided that *Millionaire* is worth putting out as a program! The only aspect of the program that I can recommend is the graphics — but these are limited and do not begin to compare with the likes of *Scuba Dive* and other competitive new releases for the Spectrum

David Lester

Program *Millionaire* **Price** £5.50 **Micro** 48K Spectrum **Supplier** Incentive Software, 54 London Street, Reading

Forth Compiler

"Faster, Faster! — Don't let Basic slow you down" That's the message on the back of the large box that contains this implementation of the Forth programming language from Thurnall Engineering

Inside the impressive package though you will find only a standard cassette tape and a small 32-page manual Don't be put off however — appearances can be deceptive

The disadvantages of Basic as a language are well known, and they add up to the fact thet it is, well basic It works it's easy to learn, but it is slow Machine-code, on the other hand is a pig to learn, hard to debug, but fast Is there a language that combines the speed of machine-code with Basic's ease of learning and use? You've guessed it, Forth does just that — well almost

Loading the cassette into the Spectrum takes just over a minute and a half at the end of which you are given a menu from which to enter programs and define your own Forth commands After you have done this it compiles your source program into machine-code Users who know only Basic will find Forth very strange to begin with, but remember what Basic felt like when you saw that for the first time, and be encouraged you will get used to Forth If you know something of machine-code you will find Forth familiar but much more friendly than Assembly Language

The manual is very much an introduction only, including just a few sample programs and brief descriptions of the predefined words and extended vocabulary provided Newcomers will therefore need to supplement it with a major guide to Forth programming: indeed Alan Winfield's *The Complete Forth* is recommended as suitable

My copy of the program had a bug which caused a system restart whenever there should have been an error report not a good idea but probably just a rogue tape Assuming that this is not a problem, then *Forth Compiler* will offer good value to anyone who's begun to grow out of Basic and wants to increase the speed and power of their programs

Simon Springett

Program *Forth Compiler* **Price** *£12 95* **Micro** Electron **Supplier** Sigma Technical Press/Thurnall Engineering

Eagle

Salamander's *Eagle* makes you a member of the Elite Intergalactic Geologists' — guiding your Eagle survey ship via the Beeb's keyboard through the four moons of the planet Thrug in search of rare trace elements.

Hazard abound, both above and below ground, and for sheer variety of screens to explore you will not be disappointed Providing, that is, you manage to stay the course!

If you are aiming for a high score, then you will have to collect the iridium pods My strategy however based on sound principles of self-preservation, involved collecting only those pods I happened to stumble across whilst concentrating on avoiding the hazards

After a while the game took its toll on me as frustration set in — my incompetent flying no doubt did not help the situation, but to my mind about ten times as much shield, or at least three lives per expedition instead of one, would not have been excessively generous

Anyhow, I look forward to a time when I am able to discover what lies beyond the Desert Moon, and if anyone is able to descend through all five levels of each of the four moons of Thrug, then they certainly get my admiration

I tried the game on some *bona fide* geologists but any notions that they might qualify for "elite intergalactic geologist" status were quickly dispelled

Simon Wilson

Program Eagle **Price** £7 95 **Micro** BBC **Supplier** Salamander 17 Norfolk Road, Brighton, East Sussex

Kamakazi

A & F's *Kamakazi* shows just how well games manufacturers have been able to find ways round speed problems of the slothful Electron. This game certainly isn't slow

With two options for controls and the option of slow or fast play I found that even the slow speed doesn't stay slow very long

Kamakazi sets you up to shoot down with a moveable gun at the bottom of the screen, wave after wave of truly Kamakazi aircraft which come at you initially from a grouped formation at the top of the screen Rather like space invaders but with aircraft The planes drop out of the sky most unpredictably and at varying diagonal drops while still off-loading bombs You have to shoot whilst at the same time dodging bombs and aircraft

You only have three lives, which are not made up at the beginning of a new wave of atack, so to get to the third wave, with only one life left (as I frequently did) does not give you much chance I'm not much of an aircraft spotter but in my three waves of attack shot down single wing, bi-planes and helicopters I'd love to know what comes next — it might have been a flying bedstead — but try as I might, with only three lives I could not get pas that third level

Whilst I was amazed at how A & F have conquered the speed problem I was a little disappointed with their efforts with the Electron's sound channel at a time For such a high speed fast action game, it is a pretty subdued affair — there are no sound effects at all for the bombs dropping or to accompany the visual explosions when either you hit an aircraft or they smash you into smuthereens

Notwithstanding when, at the end of three lives you are asked "Ready to try again?" you invariably press the space bar for another game

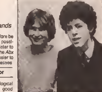
Fred Short

Program *Kamakazi* **Price** £6 90 **Micro** Electron **Supplier** A & F Software, Canal Side Industrial estate, Woodbine Street East Rochdale, Lancashire OL16 5LB


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200 + 100 = 300

***Jason Orbaum and Geoffrey Campbell** conclude their Assembly language series with a look at arithmetic commands*



Geoffrey Campbell (left) and Jason Orbaum

Last week we looked at the data handling commands available to the programmer and this week we shall look at the arithmetic commands

The commands *Sub* and *Add* perform straightforward addition and subtraction Most of the addressing modes can be used, for example

Suba #21 — subtract 21 from the contents of A,

Addb ,X — add the contents of the address pointed to by X to the contents of A,

Subd 2000 — subtract the contents of address 2000 from the contents of D.

Adda (2000) — add the contents of the address pointed to by the contents of address 2000 to the contents of A.

Unfortunately if there is an overflow ie the answer is greater than the register concerned can hold, part of the answer is lost For example 200 + 100 = 300, but if we write a short program to do it

```
Lda #200
Adda #100
```

the answer comes out as 45, which is clearly wrong This is because the register can only hold a number between 0 and 255, and so, when it reaches 256 it goes back to 0 This is overcome by use of the Carry Bit If an overflow occurs, the Carry-Bit is set to 1, otherwise it is set to zero

A similar pair of instructions are *Adc* and *Sbc*, which do the same, but also add or subtract the Carry-bit, and can therefore be used to correct overflow errors It is possible to add the contents of the B register to the contents of the X register using the *Abx* command, and this makes it a lot easier to keep track of a table of data or addresses

Com, Neg, And, Or and Eor

The next five instructions are logical operators for which you need a good understanding of the binary notation discussed in part five (*PCW* May 3-9)

The command *Com* will find the complement of a number In other words, all ones become zeros, and vice versa This means that, if the A register contained 00111010, then *Coma* = 11000101

The *Neg* instruction will negate (find the two's complement of) a signed number, so that if the B register contained 10011001 then *Negb* = 01100111 or, in decimal, if B = −100 then *Negb* = 103

And produces the logical *And* of two numbers This means that, if two corresponding bits in the two numbers are set to one, then the corresponding bit in the answer is also set to one, otherwise it is set to zero Hence

00111010 *and* 10010010 becomes 00010010

Likewise, *Or* produces the logical *Or* of two numbers If one or other or both of two corresponding bits is set to one, then the corresponding bit in the answer is set to one, otherwise it is set to zero Hence

00111010 *or* 10010010 becomes 10111010

Eor gives the logical Exclusive *Or* of two numbers If one or the other, but not both, of two corresponding bits is set to one, then the corresponding bit in the answer is set to one, otherwise it is set to zero Hence

00111010 *Eor* 10010010 becomes 10101000

The last instruction to be explained is one that is not found on many eight-bit processors at all It is the *Mul* command This will, as its name suggests, multiply two numbers together The two numbers are held in the A and B registers, and the answer is to be found in the D register

A ray of light

Neil Barnes *presents an educational physics program for the 32K BBC model B with 1.2 OS*

Ray diagrams is an educational physics tutor, written in modes 2 and 7. The subject covered is ray diagrams and various options are open to the user via a menu. Mode 7 is used for the menu and tutorial phases while mode 2 with its 16 colours, is used for the graphical representations of these phases.

Accompanying the main program is a teletext title screen and as the program is short, I would recommend it being typed in, even though it is not strictly necessary. All the spaces in the program are vital to the running of the program and must be copied exactly. These are especially important in the title screen.

Notes

PROC cursoroff	Turns cursor off
PROC big (A$,B,C,D)	Writes titles in double height: A$ — text to be printed. B — X position of starting place of text. C — colour character code. D — Y position of starting place of text.
PROC menu	Displays options to user
PROC centre	Centre ray phase
PROC parallel	Parallel ray phase
PROC diagram	Displays example diagram
PROC convex	Displays a ray through a convex lens
PROC concave	Displays a ray through a concave lens.
PROC end	End routine
PROC space (X,Y COL)	Displays "Press SPACE BAR to continue" in differing text and positions. X — X position of text. Y — Y position of text. COL — colour character code
PROC diagshow (x,y c)	Prints a message. x — x position of text. y — y position of text. c — colour character code

```
 10REM ********************
 20REM * TITLE SCREEN     *
 30REM * NEIL BARNES
 40REM * FOR PCW APRIL *
 50REM *   PHYSICS      *
 60REM ********************
 70CLS
 80A=134
 90 VDUA,145:PRINT"
100 VDUA,146:PRINT"
110 VDUA,147:PRINT"
120 VDUA,148:PRINT"
130 VDUA,149:PRINT"
140 PRINT
150 VDUA,146:PRINT"
160 VDU135:PRINT" Written";:VDUA,150:PRINT
170 VDU130:PRINT"        by";:VDUA,147:PRINT
180 VDUA,151:PRINT"
190 VDU134,136:PRINT" N E I L";:VDUA,150,
200 VDUA,149:PRINT"
210 VDU130,136:PRINT" B A R N E S";:VDUA,145,
220 PRINT
230 VDUA,146:PRINT"
240 VDUA,147:PRINT"
250 VDUA,148:PRINT"
260 VDUA,149:PRINT"
270 VDUA,150:PRINT"
280 PRINT '';VDU133:CHAIN"
```

```
 10 REM ************************
 20 REM *       RAY DIAGRAMS   *
 30 REM *       NEIL BARNES    *
 40 REM *       PCW APRIL 1984 *
 50 REM * HI TO EVERYONE AT    *
 60 REM * SCHOOL,ESPECIALLY    *
 70 REM * MR.TALBOT AND  E  WHO *
 80 REM * GAVE SUPPORT AND     *
 90 REM * ENCOURAGEMENT        *
100 REM ************************
110 DIM C$(6)
120 VDU23,224,&0201;&0804;&2010;&8040;
130MODE7
140 PROCcursoroff
150 PROCbig("PHYSICS",12,134,1)
160 PRINTTAB(13,4)CHR$134"======="
170VDU31,0,6,129:PRINT"This program should be used to help":VDU129:PRINT"pupil
s to understand the concept of"
180 VDU31,11,10,136,134:PRINT"RAY DIAGRAMS"
190 VDU31,0,13,134:PRINT"A menu will be displayed showing the"
200 VDU134:PRINT"various options open the user."
210 VDU31,0,20,157,129:PRINT"Designed and written by NEIL BARNES"
220 VDU31,8,22,134:PRINT"Copyright (C) 1984"
230 VDU31,3,24,131:PRINT"Press SPACE BAR for the menu"
240 REPEAT A=GET:UNTIL A=32
250 PROCmenu
260DEFPROCbig(A$,B,C,D)
270FOR A=1 TO 2:PRINTTAB(B,D+A)CHR$141CHR$C A$:NEXT
280 ENDPROC
```

```
     cursoroff
     202;0;0;0;

     DEFPROCmenu
     CLS:PROCbig("MENU",
340 PRINTTAB(16,4)"====
350VDU31,0,0:FOR Q=1 TO 6:PRINTTAB(1,Q+6);Q;".":NEXT
360 FOR L=1 TO 6
370 READ C$(L)
380 NEXT
390 RESTORE
400FOR LL=1 TO 6
410PRINTTAB(4,LL+6);C$(LL)
420NEXT
430 VDU31,1,18,131:PRINT"Please input your choice"
440 INPUTTAB(29,18)I:IF I<1 OR I>6 THEN PRINTTAB(28,18)STRING$(2,"   "):GOTO440
450 IF I=1 PROCcentre
460 IF I=2 PROCparallel
470 IF I=3 PROCdiagram
480 IF I=4 PROCconvex
490 IF I=5 PROCconcave
500 IF I=6 PROCend
510 ENDPROC
520DEFPROCaxis
530VDU19,0,4,0,0,0
540GCOL0,2
550MOVE0,  :MOVE0,512:DRAW1280,512:GCOL0,3
560MOVE640,1024:DRAW640,0
570 ENDPROC
580DEFPROCcentre
590 PROCcursoroff
600 CLS:PROCbig("CENTRE RAY",10,131,1)
610 PRINTTAB(12,4)"====== = =
620 VDU31,1,10,134:PRINT"A ray of light striking the optical
630 VDU134:PRINT" centre carries straight on through."
640 PROCdiagshow(1,15,130)
650 PROCspace(5,22,129)
660 VDU22,2
670 PROCaxis
680GCOL0,5:MOVE405,790:DRAW900,200:VDU5:GCOL0,1:MOVE700,550:PRINT"Principal
690MOVE700,500:PRINT"Axis":GCOL0,6:MOVE200,980:PRINT"Centre  Ray":MOVE380,100
PRINT"Lens"
700 REPEAT UNTIL GET=32
710 VDU22,7:PROCmenu
720DATA Diagram of a centre ray,Diagram of a parallel ray,Construction of a di
agram,Diagram of a convex lens,Diagram of a concave lens,End of program
730DEFPROCspace(X,Y,COL)
740 VDU31,X,Y,COL:PRINT"Press SPACE BAR for diagram"
750 REPEAT UNTIL GET=32
760 ENDPROC
770 DEFPROCparallel
780 PROCcursoroff
790CLS:PROCbig("PARALLEL RAY",9,130,1)
800 PRINTTAB(11,4)"======== ===
810 VDU31,1,10,131:PRINT"This is a ray of light which is"
820 VDU131:PRINT" parallel to the principal axis."
830 PROCdiagshow(1,17,133)
840 PROCspace(4,22,130)
850 VDU22,2
860 PROCaxis
870 GCOL0,5:MOVE0,725:DRAW640,725
880 GCOL0,7:DRAW1200,512
890 VDU5:MOVE100,1000:GCOL0,6:PRINT"Parallel  Ray"
900 MOVE380,100:PRINT"Lens"
910 GCOL0,7:MOVE1200,550:PRINT"F":MOVE200,500:PRINT"F"
920 REPEAT UNTIL GET=32
930 VDU22,7:PROCmenu
940DEFPROCdiagshow(x,y,c)
950 VDU31,x,y,c:PRINT"The diagram will be shown until the"
960 VDU c:PRINT" SPACE BAR is pressed."
970 ENDPROC
980 DEFPROCdiagram
990 PROCcursoroff
1000CLS:PROCbig("CONSTRUCTING THE DIAGRAM",5,133,1)
1010 PRINTTAB(7,4)"============ === ======="
1020 VDU31,1,8,134:PRINT"To begin constructing a":VDU31,25,8,129,136:PRINT"RAY
DIAGRAM"
1030 VDU134:PRINT" a skeleton diagram must first be"
```

continued over the page ▸

```
1040 VDU134:PRINT"constructed."
1050 PRINT :VDU131:PRINT" The lens is drawn as a vertical line
1060 VDU131:PRINT" The reference point";:VDU133:PRINT;"2F";:VDU131:PRINT"is twice as far";:VDU131:PRINT" from the lens as the principal focus"
1070 VDU133:PRINT;" F.";:VDU131:PRINT"The object is drawn as a vertical"
1080 VDU131:PRINT" arrow."
1090 PRINT :VDU129:PRINT"    Press SPACE BAR to continue".REPEAT UNTIL GET=32.CLS:PROCcursoroff:PROCbig("CONSTRUCTING THE DIAGRAM",5,133,1):PRINTTAB(7,4)"============ === ========"
1100 PRINT  TAB(1,6):VDU134:PRINT"The ray diagram is completed by drawing";:VDU134.PRINT" the";:VDU130:PRINT"centre ray";:VDU134:PRINT"and";:VDU130:PRINT"parallel ray";:VDU134:PRINT"from":VDU134:PRINT the top of the arrow."
1110 PRINT :VDU131:PRINT"The top of a real image is formed at":VDU131:PRINT"the point where the rays cross.";PRINT :VDU129:PRINT"If the rays diverge,the point";:VDU130:PRINT"from":VDU130:PRINT which they appear to come .:VDU129:PRINT"is the"
1120 VDU129:PRINT;"top of the";:VDU130:PRINT"virtual";:VDU129:PRINT"image ":VDU31,0,0
1130 PROCspace(4,24,135):VDU22,2:PROCaxis:MOVE150,512:DRAW150,595:VDU5:MOVE119,610:GCOL0,7:PRINT"^":MOVE200,610:GCOL0,5.PRINT"object"
1140 MOVE180,512:GCOL0,3:DRAW180,400.GCOL0,5:VDU5:MOVE135,380:PRINT"2F":MOVE550,512:GCOL0,3:DRAW550,400:MOVE520,380:GCOL0,5:VDU5:PRINT"F":MOVE830,512.GCOL0,7:DRAW830,400:MOVE1170,512:DRAW1170,400
1150 MOVE805,380:GCOL0,5.VDU5:PRINT"F":MOVE1120,380:PRINT"2F":GCOL0,6:MOVE140,980:PRINT"Example  Diagram":MOVE380,100:PRINT"Lens":MOVE700,600:GCOL0,1:PRINT"Principal":MOVE560,550:PRINT"Axis":REPEAT UNTIL GET=32:VDU22,7:PROCmenu
1160ENDPROC
1170DEFPROCconvex
1180 PROCcursoroff
1190CLS:PROCbig("DIAGRAM FOR A CONVEX LENS",4,134,1)
1200 PRINTTAB(6,4)"======== === = ====== ===="
1210 VDU31,1,8,133:PRINT"For a ";:VDU130:PRINT"convex";:VDU133:PRINT"lens the parallel ray is":VDU133:PRINT" bent so that it goes through the far ":VDU133:PRINT" principal focus."
1220 PRINT:VDU131:PRINT" This ray diagram is for a";:VDU130:PRINT"convex";:VDU131:PRINT lens":VDU131.PRINT" with the object beyond";:VDU130:PRINT"2F "
1230 PROCdiagshow(1,17,129).PROCspace(5,24,134):VDU22,2:PROCaxis
1240 MOVE100,512:GCOL0,3:DRAW100,600:VDU5:MOVE70,600:GCOL0,7:PRINT"^":MOVE77,612:GCOL0,5.DRAW1200,410:MOVE77,613:GCOL0,2:DRAW640,615:GCOL0,6:DRAW1100,300
1250 MOVE120,670:VDU5:GCOL0,1:PRINT"Parallel":MOVE900,500:PRINT"Centre":MOVE150,512:GCOL0,3:DRAW150,400:MOVE500,512.DRAW500,400
1260 MOVE800,512:DRAW800,700:MOVE1200,512:DRAW1200,700.MOVE100,370:GCOL0,6:VDU5:PRINT"2F":MOVE475,370:PRINT"F"
1270 MOVE770,750.PRINT"F":MOVE1150,750.PRINT"2F"
1280 MOVE840,460:GCOL0,3:DRAW840,300:VDU5:GCOL0,1.MOVE700,300:PRINT"Image":MOVE200,975:PRINT"Convex  Lens":MOVE780,100:PRINT"Lens
1290 REPEAT UNTIL GET=32 VDU22,7:PROCmenu
1300 ENDPROC
1310DEFPROCconcave
1320 PROCcursoroff
1330 CLS:PROCbig("DIAGRAM FOR A CONCAVE LENS",3,129,1)
1340 PRINTTAB(5,4)"======= === = ======= ===="
1350 VDU31,1,8,134:PRINT"The only";:VDU130:PRINT"RAY DIAGRAM";:VDU134:PRINT"for a concave":VDU134:PRINT" lens is the one shown in the diagram."
1360 PRINT:VDU130:PRINT" The virtual image is shown as a dashed ";:VDU130.PRINT" line."
1370 PROCdiagshow(1,15,133):PROCspace(4,24,131):VDU22,2:PROCaxis
1380 MOVE300,700.GCOL0,5:DRAW1175,250:MOVE400,520:VDU5:GCOL0.6:MOVE400,550:VDU224:MOVE500,600:VDU224:MOVE600,650:VDU224:MOVE700,700:VDU224
1390 MOVE300,700,GCOL0,2:DRAW640,700:MOVE300,512.GCOL0,3:DRAW300,800:VDU5:GCOL0,5:MOVE275,820:PRINT"^"
1400 MOVE50,512:GCOL0,3:DRAW50,470:GCOL0,5:VDU5:MOVE0,400:PRINT"2F":MOVE300,512:GCOL0,3:DRAW300,430:GCOL0,5:VDU5:MOVE275,400:PRINT"F"
1410 MOVE700.512:GCOL0,3:DRAW900,650:MOVE1150,512:DRAW1150,650:MOVE880,690:VDU5:GCOL0,5:PRINT"F":MOVE1100,690:PRINT"2F"
1420 MOVE660,300:GCOL0,1:PRINT"Centre":MOVE380,100:PRINT"Lens":MOVE150,975:PRINT"Concave  Lens"
1430 REPEAT UNTIL GET=32:VDU22,7:PROCmenu
1440 ENDPROC
1450 DEFPROCend
1460 CLS:PROCbig("END OF PROGRAM",9,134,1)
1470 PRINTTAB(11,4)"=== == ======="
1480 VDU31,1,8,130:PRINT"Do you want to leave the program";:INPUTD$
1490 IF D$="Y" OR D$="N" OR D$="y"OR D$="n" THEN 1500 ELSE GOTO1480
1500 IF D$="Y" OR D$="y"THEN END
1510 IF D$="N" OR D$="n"THEN CLS:PROCmenu
1520 ENDPROC
```





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Extended sets

***Alan Turnbull** shows how Sinclair Basic can be extended for those with Interface 1*

To everyone in possession of a Sinclair ZX Spectrum and ZX Interface 1, the introduction of the facility to enable programmers to extend the command set of the ZX Basic language was surely very welcome (many programmers feel it was a glaring omission from previous Sinclair systems)

This article introduces two such additions to Sinclair Basic a command which allows *Pokes* to be executed with 16-bit integer values (the equivalent of the *Dpoke* command found on some other computers) and a similar command which allows strings to be specified as the data operand (useful for creating data tables in memory) The syntax of each new command is as follows

(1) POKE! [address] [16-bit integer]
(2) POKE $ [address] [string]

An example of the first command would be

POKE! myaddress-491525+offset*8 RND*32787 which would *Poke* the low byte of *Rnd*32767* into address *myaddress-49152+offset*8* and the high byte of *Rnd*32767* into the address *myaddress 49152+offset*8+1*

An example of the second command is

POKE$30000 "Q L — Quantum Leap or Quite Late?"

which would *Poke* the string into loctions 30000 onwards

Figure 1 shows the machine code routine which adds these commands to ZX Spectrum Basic and it has been assembled in the ZX Printer buffer (because I do not use that area) The routine is relocatable in Ram but remember that the ZX Interface 1 system variable *Vector* (addresses 23735, 23736) must be altered accordingly to point to the start of the routine

Figures 2 and 3 show example Basic programs using these new commands They are not meant to be of any use — merely illustrations

In Figure 1 the following points should be noted

(1) In line 100, *Calbas* is the address of the 'shadow Rom routine which permits the calling of subroutines in the 'base or 'main' Rom (2) Lines 110–140 and 180 give the hexadecimal addresses of various routines in the 'main Rom used for checking syntax and collecting results from the calculator stack (as distinct from the Z80 microprocessor stack)
(3) In line 150 *Err-6* is the address of a routine in the 'shadow Rom which is normally entered upon syntax failure (when the system variable *Vector* is not altered)
(4) In line 160, *Chkend* is the address of a routine in the shadow Rom which accepts a line of Basic in syntax time and jumps to Basic, but in 'run time simply returns
(5) In line 170, *End-1* is the address of a routine in the 'shadow Rom which jumps to Basic when a command has been successfully executed
(6) In line 190 *Sh-err* is the address in the shadow Rom of a restart routine which reports an Interface 1 error This restart is followed by a single data byte
(7) In line 210, the accumulator is tested for 206 less than the token code for *Poke* because of calculations performed in the 'shadow' Rom just before the jump to the address through *Vector* is done
(8) In line 390 the 'main' Rom routine *Getstr* fetches the 'parameters of a string from the calculator stack with its length in the *Bc* register pair and its address in the *De* register pair
(9) In lines 430, 660 and 690, the 'main Rom routine *Getint* fetches a 16-bit integer from the calculator stack and returns it in the *Bc* register pair

I hope that readers will find these two new commands useful and that they will use the information presented here, and in the two books on the ZX Microdrive/ZX Interface 1 system by Dr Ian Logan and Andrew Pennell to develop their own new Basic commands on the Spectrum

```
Pass 1 errors  00

                 10 * Machine-code routine for Sinclair ZX Spectrum and
                 20 * ZX Interface 1 to add the new commands
                 30 * POKE $ <address>,<string>
                 40 * POKE ' <address> <16 bit integer>.
                 50 *
                 60 * (c) COPYRIGHT 1984 Alan Turnbull.
                 70 *
                 80 *
00F4             90 POKE   EQU  244            , code for token 'POKE'
0010            100 CALBAS EQU  16             , restart for calling 'base' ROM
0020            110 NXTCH  EQU  #0020          , 'main' routine-fetch next char
1C82            120 XPTNUM EQU  #1C82          , 'main' sub-expect numeric exp.
1C8C            130 XPTSTR EQU  #1C8C            'main' sub-expect string exp.
2BF1            140 GETSTR EQU  #2BF1          ,  main' routine-get string params
01F0            150 ERR_6  EQU  #01F0          , 'shadow' sub-normal syntax fail
05B7            160 CHKEND EQU  #05B7          , 'main' routine-accept statement
05C1            170 END_1  EQU  #05C1          , routine to return to 'main' ROM
1E99            180 GETINT EQU  #1E99          , 'main' routine - get 16 bit int.
0020            190 SH_ERR EQU  32             , 'shadow' restart to report errors
5B00            200        ORG  23296          , in ZX Printer buffer
5B00 FE26       210        CP   POKE-206       , was token 'POKE'?
5B02 C2F001     220        JP   NZ,ERR_6       , jump if not
5B05 D7         230        RST  CALBAS         , call a routine in 'main' ROM
5B06 2000       240        DEFW NXTCH          , collect next character
5B08 FE24       250        CP   "$"            . is seperator a '$'?
5B0A 2026       260        JR   NZ,DOUBLE      , jump to other module if not
5B0C D7         270        RST  CALBAS         , call 'main' routine
5B0D 2000       280        DEFW NXTCH          , collect next character
5B0F D7         290        RST  CALBAS         , call 'main' routine
5B10 821C       300        DEFW XPTNUM         , expect address
5B12 FE2C       310        CP   ","            , is next character a ','?
5B14 201A       320        JR   NZ,ERRC        , if not, report syntax error
5B16 D7         330        RST  CALBAS         , call 'main' routine
```

```
5B17 2000      DEFW NXTCH     ; collect next character
5B19 D7        RST  CALBAS    ; call 'main' routine
5B1A 8C1C      DEFW XPTSTR    ; expect a string expression
5B1C CDB705    CALL CHKEND    ; accept statement & return/run
5B1F D7        RST  CALBAS    ; call 'main' routine
5B20 F12B      DEFW GETSTR    ; collect string parameters
5B22 C5        PUSH BC        ; save length
5B23 D5        PUSH DE        ; save source address
5B24 D7        RST  CALBAS    ; call 'main' routine
5B25 991E      DEFW GETINT    ; collect 16 bit integer
5B27 C5        PUSH BC        ; transfer it
5B28 D1        POP  DE        ; (now destination address)
5B29 E1        POP  HL        ; retrieve source address
5B2A C1        POP  BC        ; retrieve length
5B2B EDB0      LDIR           ; move data
5B2D C3C105    JP   END_1     ; return finished
5B30 E7        ERRC   RST  SH_ERR    ; report a 'shadow' error
5B31 0B        DEFB 0         ; C Nonsense in BASIC
5B32 FE21      DOUBLE CP   "!"       ; is seperator '!'?
5B34 20FA      JR   NZ,ERRC   ; report syntax error if not
5B36 D7        RST  CALBAS    ; call 'main' routine
5B37 2000      DEFW NXTCH     ; collect next character
5B39 D7        RST  CALBAS    ; call 'main' routine
5B3A 821C      DEFW XPTNUM    ; expect a numeric exp. (address)
5B3C FE2C      CP   ","       ; is seperator a ','?
5B3E 20F0      JR   NZ,ERRC   ; report syntax error if not
5B40 D7        RST  CALBAS    ; call 'main' routine
5B41 2000      DEFW NXTCH     ; collect next character
5B43 D7        RST  CALBAS    ; call 'main' routine
5B44 821C      DEFW XPTNUM    ; expect numeric expression (value)
5B46 CDB705    CALL CHKEND    ; accept statement & return/run
5B49 D7        RST  CALBAS    ; call 'main' routine
5B4A 991E      DEFW GETINT    ; collect a 16 bit integer (value)
5B4C C5        PUSH BC        ; save it
5B4D D7        RST  CALBAS    ; call 'main' routine
5B4E 991E      DEFW GETINT    ; collect 16 bit int. (address)
5B50 C5        PUSH BC        ; transfer it
5B51 DDE1      POP  IX        ;
5B53 C1        POP  BC        ; retrieve value
5B54 DD7100    LD   (IX+0),C  ; load low byte
5B57 DD7001    LD   (IX+1),B  ; load high byte
5B5A C3C105    JP   END_1     ; return finished

Pass 2 errors 00

CALBAS 0010    CHKEND 05B7
DOUBLE 5B32    END_1  05C1
ERRC   5B30    ERR_6  01F0
GETINT 1E99    GETSTR 2BF1
NXTCH  0020    POKE   00F4
SH_ERR 0020    XPTNUM 1C82
XPTSTR 1C8C

Table used    175  from   510
```

```
10 FOR A=16304 TO 23295 STEP 5
20 POKE !A,RND*65535
30 NEXT A
40 PAUSE 0
```

```
10 FOR A=16384 TO 23264 STEP 64
20 POKE #A,"!@#$%&'()_<>ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz"
30 NEXT A
40 PAUSE 0
```

Beep, beep, beep

Adrian Warman presents a simple machine code utility program

Although the Commodore 64 computer is perfectly standard in that it uses the Ascii character set one of the more noticeable characteristics is that the machine does not comply completely with the usual functions performed by some of the codes A good example of this is the Ascii code BEL, which has the code number 7

On the majority of Ascii based computers, the following Basic instruction — *Print Chr$(7)* will result in the output of a short tone or 'beep This is not the case with the Commodore 64

The main aim of this program is to provide the CBM 64 with such a facility While in itself such a feature may appear to be of little use, it is nevertheless a short compact routine that can be easily modified to produce a range of tones and frequencies In addition the coding used in the program demonstrates one way of intercepting and manipulating the data being used by the system as it performs its 'housekeeping tasks

Simply load (or type in) the Basic loader program When Run this will store the machine code To activate, simply type *Sys 49152* From then on whenever *Print Chr$(7)* or an equivalent appears a tone will be produced by the computer

By looking through the invaluable *Commodore 64 Programmers Reference Guide* while paying particular attention to the memory map of system locations you can see that memory locations *$0326* and *$0327* contain what is described as the *Kernal Chrout Routine Vector'* This is one of the most important vectors in the computer in that whenever the computer is outputting a character (to the disc, the screen or to the printer), the character is placed into the accumulator register of the 6510 CPU, and the routine addressed by this vector is called This means that, by 'intercepting this vector, we can inspect the character that is about to be output before it is finally 'sent'

Lines 1090-1130 redirect this vector to point to an extra little routine called *Bellscan* Note that this new routine can be relocated to any position in memory, but that the vector at *$0326* and *$0327* must then be changed to point to the new start position From then on whenever a character is about to be output by the computer, the CPU will first jump to the new routine

Lines 1220-1240 first of all store the current character in the *A* register We are manipulating the system routines in a special fashion and for safety reasons (ie we don t want the computer to crash!) we attempt to make the routine as transparent as possible We will only use the *A* register in this program so we must preserve its contents in a convenient place — here, the stack is used

Having stored the contents of *A*, we now test to see if it is the Ascii code 7 — *Bel* If not we do not want to produce a 'beep , so skip over the next few instructions

Lines 1300-1400 having found the *Bel* character we want to produce a short beep This will be done using the powerful Sid chip First of all, it is necessary to set up the parameters for producing the beep It is assumed that we will use voice number 3 to produce the tone (In this next section of the description you may find it helpful to refer to the Sid description in the *CBM 64 Programmers Reference Guide*)

After clearing the *A* register (line 1300) the low frequency selector of voice 3 and the attack/decay register of voice 3 are both set to zero (lines 1310 and 1320) The high frequency of voice 3 is set to *$40* (lines 1330 to 1340) Thus the overall frequency of voice 3 is *$4000* (just above B of the fifth octave)

Next, we then set the sustain/release value to *$F8* (lines 1350 to 1360) This means that the tone will be sustained at the maximum volume and when released the tone will die away over a period of about 300 ms (which is just nicely long enough)

Last of all the master volume must be set (to the maximum) at *$0F* (lines 1370 to 1380) This done we want to actually hear the sound, so the Triangle waveform is selected and switched on (lines 1390 to 1400)

Lines 1410-1440 produce a very slight delay by a simple loop, to enhance the sound (which will then be in its sustain phase) Lines 1450-1460 disable the wave (which causes it to enter the release phase) but note that the Triangle waveform is still selected If this was not the case then nothing would be heard during the release phase

Lines 1480-1490 provide the tidy exit from the program (it is to these lines that the CPU jumps if a *Bel* character was not found) First of all the old *A* register data is reloaded and then a jump is made back into the Rom routine for handling character output in the usual fashion

```
1000 REM BASIC LOADER FOR ASCII 'BEL' PROGRAM.
1010 :
1020 REM BY A.WARMAN
1030 :
1040 ADDRESS=49152
1050 SUM=0
1060 :
1070 FOR LOC=ADDRESS TO ADDRESS+59
1080  READ DATUM
1090  POKE LOC,DATUM
1100  SUM=SUM+DATUM
1110 NEXT LOC
1120 :
1130 IF SUM<>6884 THEN PRINT "SUM ERROR."
1140 STOP
1150 :
1160 DATA 169, 11,141, 38,  3,169,192,141
1170 DATA  39,  3, 96, 72,201,  7,208, 40
1180 DATA 169,  0,141, 14,212,141, 19,212
1190 DATA 169, 64,141, 15,212,169,248,141
1200 DATA  20,212,169, 15,141, 24,212,169
1210 DATA  17,141, 18,212,169,  0, 24,105
1220 DATA   1,208,251,169, 16,141, 18,212
1230 DATA 104, 76,202,241
```

```
1000 C000          *=$C000
1010 C000          ;
1020 C000          ; ASCII 'BEL' CHARACTER FOR THE CBM 64 COMPUTER.
1030 C000          ;
1040 C000          ; BY A.WARMAN
1050 C000          ;
1060 C000          ; FIRST REDIRECT OUTPUT VECTOR TO
1070 C000          ; INTERCEPT EACH CHARACTER.
1080 C000          ;
1090 C000 A90B               LDA #<BELLSCAN
1100 C002 8D2603             STA $0326
1110 C005 A9C0               LDA #>BELLSCAN
1120 C007 8D2703             STA $0327
1130 C00A 60                 RTS
```

continued on page 35 ▶


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```
C008            ;
C008            ;
C008            ; EACH TIME A CHARACTER IS OUTPUT, THIS
C008            ; ROUTINE IS CALLED FIRST. A COMPARISON
C008            ; IS MADE TO SEE IF THE CHARACTER IS
C008            ; ASCII CODE 7 ('BEE'), IF NOT, THEN
C008            ; PROCEED TO OUTPUT NORMALLY.
C008            ;
C008 48         BELLSCAN   PHA
C00C C907                  CMP #$07
C00E D028                  BNE NOTBELL
C010            ;
C010            ; FIRST DEFINE CERTAIN VALUES FOR THE SOUND
C010            ; CHIP, 'SID'. ALL SOUND WILL COME
C010            ; FROM VOICE CHANNEL 3.
C010            ;
C010 A900                  LDA #$00             ; RESET LDA FREQUENCY
C012 8D0ED4                STA $D40E            ; RESET ATTACK/DECAY.
C015 8D13D4                STA $D413
C018 A940                  LDA #$40
C01A 8D0FD4                STA $D40F            ; SET HIGH FREQUENCY.
C01D A9F8                  LDA #$F8
C01F 8D14D4                STA $D414            ; SET SUSTAIN/RELEASE.
C022 A90F                  LDA #$0F
C024 8D18D4                STA $D418            ; SET MAXIMUM VOLUME.
C027 A911                  LDA #%00010001       ; SELECT AND ENABLE
C029 8D12D4                STA $D412            ; TRIANGLE WAVE.
C02C A900                  LDA #$00             ; PRODUCE A DEFINITE
C02E 18         DLYLOOP    CLC                  ; DELAY BEFORE THE
C02F 6901                  ADC #$01             ; RELEASE PHASE.
C031 D0FB                  BNE DLYLOOP
C033 A910                  LDA #%00010000
C035 8D12D4                STA $D412            ; DISABLE WAVE.
C038            ;
C038 68         NOTBELL    PLA                  ; RELOAD CHARACTER.
C039 4CCAF1                JMP $F1CA            ; DO NORMAL OUTPUT.
LABELS-
 C008 BELLSCAN     C02E DLYLOOP     C038 NOTBELL
```

Open Forum

Open Forum is for you to publish your programs and ideas. Take care that the listings you send in are all bug-free. Your documentation should start with a general description of the program and what it does and then give some detail of how the program is constructed. We will pay the _Program of the Week_ double our new fee of £6 for each program published

Character Drawer

on Vic20

This is a program for the unexpanded Vic 20, together with the Vic-1520 printer/plotter. It allows the user to print out user-defined graphics and the full Vic character set in either normal or reversed mode, and in a large variety of sizes. Here is an explanation of how to use it.

1. Press the number corresponding to the graphics set you wish to use. If you use 7 or 8 then the characters should first be in the memory before this program is run. To save time, press nine if you don't want to change the characters in memory.

2. No of character. Refer to page 141-142 of your user guide. Enter a number. This number depends on the character set you choose.

3 X Axis size. Enter a number from 1 to 50. This sets the width of the character. 1 is about equal to the 80 character mode on the vic-1520.

4 Y Axis size. Enter a number from 1 to 50. This sets the height of the character. 1 is about equal to the 80 character mode on the vic-1520.

5 x Axis start. Enter a number from 0 to 470. This sets the horizontal start position. If the x axis size is large then this number should be small and vice versa.

6 y Axis start. Enter a number from 0 to +/- 998. This sets the vertical start position.

If you have user-defined characters in a program that are placed together to form a larger character, then you can do the same on your plotter with some simple mental arithmetic, ie if the character width is 10 and the x axis start position of the first character is 100 then the x axis start of the second character would be 180. The formula for this is

char 2 × axis start = char 1 × axis start +(char width *8)

To put characters under one another use the same method.

```
0 OPEN1,6,1:GOSUB50
1 PRINT "NO. OF CHARACTER":INPUTA:A=A-AA
 C-7168+8*A
2 PRINT "X AXIS SIZE":INPUTSI:PRINT "Y AXI
S SIZE":INPUTSZ
3 PRINT "X AXIS START":INPUTP
4 PRINT "Y AXIS START":INPUTH:GOSUB200
5 FORB=CTOC+7:FORI=1TOSZ
10 IFPEEK(B)AND128THENX=P:Y=P+SI:GOSUB30
11 IFPEEK(B)AND64THENX=P+SI:Y=P+SI*2:GOS
UB30
12 IFPEEK(B)AND32THENX=P+SI*2:Y=P+SI*3:G
OSUB30
13 IFPEEK(B)AND16THENX=P+SI*3:Y=P+SI*4:G
OSUB30
14 IFPEEK(B)AND8THENX=P+SI*4:Y=P+SI*5:GO
SUB30
15 IFPEEK(B)AND4THENX=P+SI*5:Y=P+SI*6:GO
SUB30
16 IFPEEK(B)AND2THENX=P+SI*6:Y=P+SI*7:GO
SUB30
17 IFPEEK(B)AND1THENX=P+SI*7:Y=P+SI*8:GO
SUB30
18 H=H-1:NEXT:NEXT
19 CLOSE1:GOTO0
30 PRINT#1,"M",X,H:PRINT#1,"D",Y,H:RETUR
N
50 PRINT "CHOOSE"
51 PRINT "1. UPPER CASE":PRINT "2. UPPER
CASE REVERSED":PRINT "3. LOWER CASE"
52 PRINT "4. LOWER CASE REVERSED":PRINT "
5. GRAPHICS":PRINT "6. GRAPHICS REVERSED"
55 PRINT "7. USER DEFINED":PRINT "8. USER
DEFINED REV":PRINT "9. RUN PROGRAM"
56 PRINT "10. LOWER C. GRAPHICS":PRINT "11
. LOWER C. GRAPHICS REVERSED"
57 INPUTA$
58 IFVAL(A$)<1ANDVAL(A$)>11THEN57
59 ONVAL(A$)GOTO100,110,120,130,140,150,
160,170,180,185,190
60 GOTO57
100 AA=0:FORA=7168TO7679:POKEA,PEEK(A+25
600):NEXT:RETURN:REM**SET UPPER CASE**
110 AA=0:FORA=7168TO7679:POKEA,PEEK(A+26
624):NEXT:RETURN:REM**SET REVERSED UPPER
 CASE**
120 AA=0:FORA=7168TO7679:POKEA,PEEK(A+27
648):NEXT:RETURN:REM**SET LOWER CASE**
130 AA=0:FORA=7168TO7679:POKEA,255-PEEK(
A+27648):NEXT:RETURN:REM**SET REVERSED L
OWER CASE**
140 AA=64:FORA=7168TO7679:POKEA,PEEK(A+2
6112):NEXT:RETURN:REM**SET GRAPHICS**
150 AA=64:FORA=7168TO7679:POKEA,255-PEEK
(A+26112):NEXT:RETURN:REM**SET REVERSED
GRAPHICS**
160 PRINT "IF THE SHAPES ARE IN THE MEM
ORY, THEN PRESSANY KEY TO CONTINUE"
161 PRINT "IF NOT,THEN LOAD AND RUN A P
ROGRAM WITH USER DEFINED"
162 PRINT "GRAPHICS THEN RE-LOAD THIS ONE"
163 GETA$:IFA$=""THEN163
164 AA=0:RETURN
170 FORA=7168TO7679:POKEA,255-PEEK(A):NE
XT:RETURN
180 RETURN
185 AA=64:FORA=7168TO7679:POKEA,PEEK(A+2
8160):NEXT:RETURN:REM**L.C GRAPHICS **
190 AA=64:FORA=7168TO7679:POKEA,255-PEEK
(A+28160):NEXT:RETURN:REM**L.C.GRAPHICS
REV **
200 OPEN2,6,2:PRINT "COLOUR OF CHARACTER"
:PRINT "0. BLACK":PRINT "1. BLUE":PRINT "
2. GREEN":PRINT "3. RED"
210 INPUTCO:PRINT#2,CO:CLOSE2:RETURN
```

Character Drawer
by D Gartrell

Logo

on Spectrum

This program produces the Logo of a well known alternative TV channel. Apart from anything else it shows how *Plot* and *Draw* can be used to produce blocks of colour

```
10 PAPER 0. BRIGHT 1· BORDER 0
CLS
20 INK 3· FOR x=0 TO 17. PLOT
88,x  DRAW 16,0  PLOT 128,x  DRA
W 32,0  NEXT x
30 INK 8  FOR x=107 TO 126  PL
OT x,0  DRAW 0,40. PLOT x,63  DA
RW 0,55  PLOT x,119  DRAW 0,x-10
6  NEXT x
40 INK 4  FOR x=1 TO 18. PLOT
151,42+x: DRAW 26,0. PLOT 50,42+
x: DRAW 75,0  NEXT x
50 INK 2. FOR x=129 TO 146. PL
OT x,103  DRAW 0,x-127. PLOT x,1
8  DRAW 0,85  NEXT x
60 INK 6  FOR x=50 TO 78· PLOT
x,64· DRAW 103-x,103-x  NEXT x
70 LET c=08  FOR x=129 TO 144·
PLOT x,x-16  DRAW 0,(28 AND x<1
32)+(c AND x>=132)  IF x>=132 TH
EN LET c=c-2
80 NEXT x  PAUSE 0
```

Logo
by David McIlfatrick

Typing Tutor

on Dragon

This program teaches typing on the Dragon 32. It uses block graphics to draw the keyboard. The score and the number of tries are at the top; the bottom of the screen tells you what to type

Program notes

10-40	Copyright
50-60	Define variable and clear screen
70-250	Draw keyboard
260	Zero variable and print score and tries.

```
10 REM TYPING TUTOR
20 REM COPYRIGHT J.BLATCH
30 REM DECEMBER 1983
40
50 SC=0:A$="1234567890!£#%&'( )*=]@P
OIUYTREWQ _[ASDFGHJKL;/.,?><MNBVCXZ"
60 CLS
70 PRINT@66,STRING$(28,128)
80 PRINT@90,CHR$(128);
90 FOR A=33 TO 41
100 PRINTCHR$(A);" ";
110 NEXT
120 PRINTCHR$(176);" ";CHR$(42);" "
;CHR$(61);" BK";CHR$(128)
130 PRINT@129,CHR$(140);CHR$(128);
140 FOR A=49 TO 57
150 PRINTCHR$(A);" ";
160 NEXT
170 PRINT"0   - BK";CHR$(128) CHR$
(140)
180 PRINT@161,CHR$(123);"  ";
190 PRINT"Q !' E R T Y U I O P @ ";
CHR$(95);"  ]" CHR$(128)
200 PRINT@193,CHR$(128);"[ A S D F
G H J K L .+ EN CL";CHR$(128)
210 PRINT@225,CHR$(128);"SH Z X C V
B N M , . / SH";CHR$(128);CHR$(131)
;CHR$(131);CHR$(131)
220 PRINT@257,CHR$(128);STRING$(18,
176);"<";CHR$(176);">";CHR$(176);"?"
;STRING$(2,176);CHR$(128)
230 PRINT@289,STRING$(27,128)
```

Open Forum

```
240 PRINT@226,CHR$(128);"S P A C E
B A R",CHR$(128)
250 PRINT@358,STRING$(17,128)
260 B=0:Z=0:PRINT@0,"SCORE=",SC,
"TRIES=";P
270 Z=RND(62):P=P+1:IF P>51 THEN
400
280 IF Z=53 THEN B$="ENTER":B=13:
GOTO340
290 IF Z=60 THEN B$="CLEAR":B=12:
GOTO340
300 IF Z=61 THEN B$=CHR$(34):B=34:
GOTO340
310 IF Z=62 THEN B$="SPACEBAR":
B=32:GOTO340
320 B$=MID$(A$,Z,1)
330 B=ASC(B$)
340 PRINT@416,"TYPE:";B$
350 Z$=INKEY$
360 IF Z$="" THEN 350
370 Z=ASC(Z$)
380 IF Z=B THEN SC=SC+1:SOUND200,1:GOTO260
390 SOUND1,2:GOTO260
400 CLS:PRINT"YOU HAVE SCORED";SC;" OUT OF 50"
410 PRINT"AGAIN (Y/N)"
420 A$=INKEY$
430 IF A$="Y" THEN RUN
440 IF A$="N" THEN CLS:END
450 GOTO 420
```

Typing Tutor
by J Blatch

Arcade Avenue

Finer graphics

It has been said in the past that one disadvantage of wonder computers with unlimited *Ram* is that they encourge sloppy programming and inefficient code. Less spectacular hardware requires all the programmer's skills to overcome its limitations. Nowhere is this more true than with the unexpanded Vic and the ZX81 (which still sells in respectable numbers). For the latter has just been produced *Forty Niner* from Software Farm which must be one of the most impressive games ever devised for the machine. There are few games that can be unreservedly recommended to all owners of a machine but this one qualifies and proves you don't have to put up with watching little squares and X s creeping around the screen.

Forty Niner is said to have graphics with a resolution 'as good as the Spectrum'. Although the claim is a slight exaggeration and sometimes the action is a bit blurry, the resolution is surprisingly good and, as an added bonus, the game is also great fun — out of a batch of ZX software I looked at recently I came back to this one more than any of the flashy full colour Spectrum games. The only complaint I can make is why only one game? Now the system for unlocking finer graphics has been developed then let's have a batch of programs using the techniques. The plot of the game is similar to the *Dig Dug/ Mr Do* type where you burrow your way through the ground collecting objects and avoiding various nasties. Incidentally, the monster that eats away at your protective pile of dirt is one of the most entertaining I have seen in any game.

One interesting point about the new software protection development from JLC is how the attitude of software houses will change towards the various 'buy & try' or software rental schemes that have been denounced as encouraging home piracy. If this becomes a thing of the past then companies eager to reap the new financial benefits should also stop and look at their industry from the consumer's point of view. At £6-7 a time, much of the software being offered is still of a poor standard and with the increased demand, small specialist shops are no longer in a position to continue demonstrating games (whilst the computers in the large chain stores are perpetually corrupted by schoolboy geniuses). Now with the appearance of the professional marketeers and promotion men and the glossy cassette wrappings, it is more and more important that the public should not be asked to buy games unseen.

It is surely in the interest of the reputable companies like Bug-Byte and Psion to offer some form of short loan or 'preview' tapes. I also wonder whether the much discussed 'cost - of - piracy - that - is - passed - on - to - the - consumer - in - the - end' could now be cut, if the anti-copying scheme takes off will games prices fall?

But to end on a lighter note let's kick off some high scorers. We have had a letter from Nigel Canham of Ipswich who had a score of 114,580 on the eleventh level of *Lunar Jetman* and 239,620 on the 23rd level of *Chuckie Egg*. Well done Nigel. Chuckie is one of my favourite games but those lifts get me every time. Let's keep those letters coming.

Tony Kendle

The Arcade Corner is a new section for anyone who enjoys playing arcade games. If you have any comments, from playing tips on difficult games or programs you'd particularly like to praise (or blame?) then write to Tony Kendle, Arcade Avenue, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD.

Open Forum

Shop Sign

on Spectrum

This program scrolls a message — up to 3000 characters on the 48K computer or about 1000 on the 16K — across the screen from right to left. It continues to do this until you stop the program

When *Run* the computer asks you to input the text or message to be scrolled across the screen When this has been done, press *Enter* and the computer will ask you for the colour of the *Ink*, *Paper* and *Border*

The surrounding or Graphic Display is then entered You can input anything for this, but the number of characters entered must not exceed 31 If no surrounding is desired, then a line of spaces must be left

Experimenting with this program can lead to some very eye-catching displays For example, if, when prompted by the computer to input the surrounding you type in 31 characters and then leave a line of 31 spaces, you achieve a very pleasant effect. The computer is printing a line of characters and then a line of spaces over that, so giving the effect of the characters being erased The bottom half of the screen is left unused so that you can print your own fixed messages (You write your own messages into the program between lines 150 and 160)

Program notes

Lines 10-40	The message is typed in A$ is the name given to the message entered.
Lines 50-75	Colour of *Ink*, *Paper* and *Border* is entered No number greater than 7 or less than 0 is allowed
Lines 80-90	The surrounding or graphic display is entered E$ is the name given to the display entered.
Line 95	Clear screen
Line 100	Prints first 31 characters of the message
Line 110	The first character of the message is printed at the end of the passage to be displayed And so the screen looks as if it is being scrolled from right to left.
Lines 120-140	Two graphic displays are printed. One above and one below the message
Line 160	This whole process is repeated until the program is stopped

```
   1 REM Shop Sign
  10 PRINT "Text ?"
  20 INPUT a$
  30 IF LEN a$<31 THEN LET a$=a$
+a$
  40 IF LEN a$<31 THEN GO TO 30
  50 INPUT "Ink ?",b
  55 INK b  IF b>7 OR b<0 THEN G
O TO 50
  60 INPUT "Paper ?";c
  65 PAPER c  IF c>7 OR c<0 THEN
 GO TO 60
  70 INPUT "Border ?",d
  75 BORDER d  IF d>7 OR d<0 THE
N GO TO 70
  80 PRINT  Surrounding ,'
  82 IF INKEY$="n" THEN GO TO 15
0
  85 INPUT e$  IF LEN e$<31 THEN
 LET e$=e$+e$
  90 IF LEN e$<31 THEN GO TO 85
  95 CLS
 100 PRINT AT 6,0,a$( TO 31)
 110 LET a$=a$(2 TO )+a$(1)
 120 FOR g=0 TO 1
 130 PRINT AT 3+g*8,0;e$( TO 31)
 140 NEXT g
 150 LET e$=e$(LEN e$)+e$( TO LE
N e$-1)
 160 GO TO 100
```

Shop Sign
by Craig Oliver

Microradio

GW6JJN

Over its head!

The Radio Society of Great Britain (RSGB) which looks after the interests of radio amateurs in this country, seems finally to have recognised the fact that large numbers of radio enthusiasts now use a computer in their hobby The RSGB journal, Radio Communication, in its March edition made this plain when they said in an editorial that they propose to take a more active role in this area Among other points regarding this policy they mention that consideration is being given to a regular radio computing column

This idea was suggested about a year ago by the radio-computing user groups and the idea was rejected as not being relevant to the hobby of amateur radio The adoption by the Radio Society of the computer as an important aspect of radio communications can be considered a breakthrough and as Microradio is the only computer/radio column in this country, then I cannot help but feel that this column and its readers have helped enormously and the RSGB is to be congratulated on having made it

Another idea floated in the same piece is the possible adoption of a 'prefered' computer To me this idea is dubious in the extreme The ITV companies floated this idea a few months ago and it was rejected since they felt it may alienate some of their viewers as well as their advertisers Since the RSGB is an enormous influence on the hobby of amateur radio and the society has a great deal of respect in many areas, I feel that the idea of adopting a specific brand of computer may lead to a great deal of disappointment as well as confusion

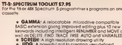
Having entered the world of radio-computing this late in the day, the RSGB will find itself confronted by many thousands of radio amateurs who already have a preferred computer — their own All of the work that has been done by radio enthusiasts who have computers, many of them readers of this column, is too important to be arbitrarily set aside simply because it is on the wrong machine If a particular computer is adopted, then the society's publications will reflect this fact and lead to the alienation of many members with an important contribution to the hobby

The RSGB suggests that such a choice should be based on technical specification and factors such as expected life In an industry as volatile and uncertain as the microcomputer industry, crystal balls are rare and looking into them can lead to expensive mistakes

In the things that the RSGB know best, radio communications, it has never adopted a 'preferred' radio transmitter Why then, when testing the temperature of the fast changing world of radio-computing, should it leap in over its head?

Ray Berry GW6 JJN

This series of articles is designed for radio and microcomputer enthusiasts alike. If you have any queries that you want answered, hints and tips to share or topics that you would like to see covered, write to Ray Berry, Microradio, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD



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Tony Bridge's Adventure Corner



The Magic Dragon

This week some more *Quill'd* adventures. K Cook of Hereford sent along a tape of a program called *Time-Search*. The scenario of the adventure concerns the discovery of the Ultimate Weapon — the Time Stabilizer. This device creates a "time bubble" around an area, effectively sealing it off from the rest of the world. Unfortunately, Something Has Gone Wrong, as it always does, and It Is Up To YOU to save the world from the ravishes of this weapon! There is a "McGuffin" present in *Time-Search*, the "legendary Crystal of Mirrors", which can help you in your quest through the Time Bubble, in which present, past and future have become intermingled.

All the locations are drawn from the real countryside of Herefordshire, and the player can use a road map to get about the world of *Time-Search*. Over 40 towns and villages are included, so if you are a native of Hereford, or even if you just want to get a flavour of this beautiful county, have a go! A very well-designed title-page, complete with serif lettering and a couple of enigmatic pictures leads to the instructions, which scroll up the screen as you read them.

After a few minutes cursory glance at the adventure itself, I would say that the main interest comes from wandering around locations one knows to be real, but I hdpe to get stuck in to the game proper, and I'll report later on the puzzles contained therein. According to the author, nothing is left to chance, and, like all good adventures, anything which happens "is a direct result of action taken, even the dream sequences which start once the Crystal has been found".

Mr Cook hasn't told me what price his adventure is going for, but here is the address:

K COOK
17 WHITEHOUSE DRIVE
KINGSTONE
HEREFORD

Incidentally, Gilsoft go to some lengths in the manual to *The Quill* to remind authors to "tidy up" their programs before marketing, in areas such as grammar and spelling. This is a failing of *Time-search*, and the layout, too, is generally rather untidy.

This is not a problem that is encountered in the next Adventure that I'll look at this week, *Spoof* (The Magic Dragon), from Runesoft. Although the user should type *Load " " Code* (despite the instructions on the cassette), and the fact that the use of *The Quill* is not mentioned anywhere (bit of a bad show, lads!), nevertheless *Spoof* is an interesting adventure. It is "an amusing frolic through the world of magic rings, quests, monsters and even a magic dragon thrown in for good measure".

The game, written by D V Stevenson and J A Black, opens with a title screen dotted about with cryptic clues, a goblet, a crown, a pair of eyes like mine after a Saturday night, a baby's bottle... what? Like all *Quill'd* adventures, it takes a long time to load. The player starts in the village square, in front of a General Store. A sale is on, of adventure kits — how could any adventurer resist?

After entering the store, a bit of haggling with the store keeper reveals the information that he is "the Doctor", and will give you the adventure kit if you agree to go on a quest for him. This turns out to be a search for the missing component to his time machine... hang on, The Doctor? The Time Machine? Anyway, the kit, when you have it, turns out to have several important items like bandages, sandwiches, and so on. Taking Slice, your trusty sword (which doesn't bode well for a nice peaceful adventure, does it?), you can then start exploring. The surrounding countryside of the village contains "The Obligatory Mountain", "The Essential Ocean" as well as "The Secret Tunnel In The Rock".

There is also "the Telephone", which rings when you get near it. You answer it, of course, and the voice at the other end asks for Dave. Then you notice a figure down on the Beach, waving at you... yes, that's Dave! Call him and he will start singing about Fishfingers! And so it goes on.

There is a lot of wry humour in the adventure and a lot of satire at the expense of many other well-known programs. *The Quill* has been used very well, with a lot of colour, and simple line-graphics.

RUNESOFT
CHARNWOOD HOUSE
87 LOWER PARLIAMENT ST
NOTTINGHAM NG1 3BB

Finally this week, I want to recommend another *Quill'd* program, *Nosferatu*. It has a very well-written manual (at last, no spelling mistakes) with a breakdown of the commands and background.

But the way in which *Nosferatu* differs from any other Spectrum adventure, and one which I'm sure must become more familiar, is the inclusion in the package of several "found objects". These have become a way of life for Infocom-players, and consist of little scraps of paper, newspaper clippings, books of matches, tablets and other clues. In *Nosferatu*, they take the form of a page from a diary, a theatre ticket (for a Horror Night!) and a couple of fragments of text about Vampires.

Presumably, these will have some bearing on the adventure, but I have only been playing it for a couple of days, and I'm still stuck in the plummeting airliner, desperately hunting for the parachute that I know must be around somewhere. Graham Shaw, the author, has taken John (Hallowe'en) Carpenter, Hammer movies, Alfred (*Tiger, Tiger* — great, *Golem* — boring) Bester and "my local video hire shop" as his inspiration. They've done a great job, and I look forward to seeing this adventure become the hit that it deserves to be. Details of when this program will be released later.

This series of articles is designed for novice and experienced Adventurers alike. Each week Tony Bridge will be looking at different Adventures and advising you on some of the problems and pitfalls you can expect to encounter. So if you have an Adventure you want reviewed, or if you are stuck in an Adventure and cannot progress any further, write to Tony Bridge, Adventure Corner, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD.

HOBBIT ANSWERS

We had several hundred entries for our *Hobbit* competition, nearly all of which were correct. The first 50 correct winners will all receive copies of Melbourne House's *A Guide to Playing The Hobbit* in the next few days, if they have not already received them.

1 What is Durin's Day?
2 What is Thorin's last name?
3 Where does Elrond live?
4 What is Gollum's birthday present?
5 What is the answer to the riddle:
A box without hinges, key or lid
Yet golden treasure inside is hid
6. Where does Gandalf's cousin, Radagast live?
7 Why did Bilbo name his sword Sting?
8 What is the name of Thorin's father?
9 What is the necklace of Girion, Lord of Dale, made from?
10 What was laid on Thorin's tomb?

1 Durin's Day is the first day of the dwarves' new year
2 Thorin's last name is Oakenshield
3 Elrond lives in Rivendell
4 Gollum's 'Present' is The Ring
5 The answer to the riddle is eggs
6 Radagast lives in Rhosgobel near the southern borders of Mirkwood
7 Bilbo named his sword Sting after killing a spider with it
8 Thorin's father was Thrain
9 Girion's necklace was made from 500 emeralds
10. Orcrist was laid on Thorin's tomb (but we also allowed the Arkenstone which was place *Inside* the tomb)



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Peek & Poke



SCREEN SHOW

P Flounders of Hartlepool, Cleveland, writes

Q **I own a ZX Spectrum (48K) and recently a friend and I wrote a program. We then decided to write a screen presentation. When this was done we were unable to merge these both together into one program. We have tried various methods but have failed to come up with any solution. Can you please help us?**

A If your two programs were written in Basic then you should have no real problem provided that
a) you have used different line numbers in each program
b) the two programs when lumped together will fit into memory

If one or both of your programs is not written in Basic then I am not sure what it is that you are trying to achieve

SPECTRUM ADAPTOR

Ned Hedworth of Leyburn, Yorkshire writes

Q **As I was watching The Computer Program on the BBC One Sunday, I noticed them using a teletext adaptor and Micronet. Is it possible to use either of these things on a 48K Spectrum and if so, where are they available from?**

A It is possible to access Micronet using a Spectrum. For information on available modems I suggest you contact Prism Business Systems at Prism House, 18-29 Mora Street, London EC1V 8BT

Their VTX5000 modem is one I have recommended before and they have recently announced the availability of a teletext adaptor for the Spectrum

TRANSFER MARKET

R Willmott of Franklin Road, Weymouth, writes

Q **Can you tell me if anyone markets a program similar to the tape copy types, which will allow me to transfer cassette based machine code games to microdrives? This is for personal convenience only as obviously the microdrive cartridges make nonsense of illegal copying for profit.**

A I have not heard of anyone who markets such a program. This is probably because the normal cassette tape copiers are actually loaded into the area of memory reserved for the microdrive buffer (which is not normally used by commercially produced software.)

But if we hear of one we will publish details once we've tried it out

BIG BROTHER

C Heywood, of Manselton, Swansea writes

Q **I have just been given a Brother EP-44 printer. The manual states that the printer can be used with several Home Computers. The computers shown are the Apple II, CBM 64, VIC 20, TI 99/4A, TRS 80 etc.**

My own computer is a 16K Spectrum. As this is not listed could you tell me if they are compatible and also if anyone makes a suitable interface? The printer has an RS-232C connector.

Also, I have just tried to copy *Santa's Mission* published in your Dec 22nd issue. I am unable to input the last line which contains data. I have since tried two more 16K programs and I find that the last few lines will not go in. There is no warning beep when the memory is full. Could you tell me if there is a fault please?

A Your printer is compatible with the Spectrum and an interface is available for you to use RS-232. The interface is called Interface 1 and is produced by Sinclair Research (the microdrive interface)

Your second question poses more of a problem. If you get no warning beep when the memory becomes full, I presume you are getting the Out of Memory message. In that case I would say that you do have a fault with your machine in that you should get the warning beep (more of a buzz really) when trying to *Enter* a line of Basic. The only time that the message should appear without the buzz is when you *Run* the program

However, as you aren't complaining of failure in loading programs I am not convinced that the fault necessarily lies with the computer.

It could be that you have made an error during the typing marathon that has confused the Spectrum editor, such as *Poke*ing the wrong area of memory. But without a listing I cannot be sure

DRAGON MONITOR

R Freeman of Harrogate Road, Leeds, writes

Q **I own a Dragon 32 and am interested in purchasing a cheap colour monitor. What is the most suitable set and how much will it cost?**

A I would suggest a monitor from the Sanyo range, mainly because they have a good reputation in this and related fields, and because they are a well-known name with a good service and dealer network

As to the costs, you get what you pay for. The resolution is the important factor. The CD3125 normal resolution monitor costs about £200. The CD31127 medium resolution monitor costs about £330. The CD3115 high resolution monitor costs about £450. Although Normal resolution should be fine for most purposes, information from Sanyo Mitsubishi (UK) Ltd, Sanyo House, 8 Greycaine Road, Watford, Herts

BASICODE PROBLEM

E Jones, Richmond, N Yorkshire writes

Q **Can you or any of your readers help me with the problem of working the *Basicode 2* program. I have a CBM64 and the *Basicode* tape loads correctly, but after that I am lost**

After running the program, I choose option 1 (to load) and press *Space* to continue. This returns me to the menu screen, at which point I press Stop/Restore and type SYS 40448 to delete lines from 1000 onwards and load a *Basicode* program.

Everything works OK. When I want to load a second game and repeat this method I get a loading error on line 10 which is a *Go To* 1000 and there is not a line 1000. How do I load a second game?

A Bit of a problem this. It seems to me that you must be doing something silly but for the life of me I can't think what it is

Perhaps I can answer your questions with some more questions
1) How are you stopping the first game? (hopefully using Stop/Restore)
2) Are you able to list the main *Basicode* program after you've stopped the first game?
3) Have you tried SYS 40483 after getting a loading error?
4) Do you have a *Basicode* User's Handbook? If not, then I suggest you get one. It can be obtained from Broadcasting Support Services, P O Box 7 London W3 6XJ for £3 95

Is there anything about your computer you don't understand, and which everyone else seems to take for granted? Whatever your problem *Peek* it to Phil Rogers and every week he will *Poke* back as many answers as he can. The address is *Peek & Poke*, *PCW*, 12-13 Little Newport Street, London WC2R 3LD.


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Commodores for sale

VIC 20 STARTER PACK under guarantee complete with extras (some cassette and adventure cartridge magazines etc) Total cost £170 Will sell for £100 ono Tel 01 644 6224 (evenings)

CBM PET COMPUTER Slightly faulty Powers up with "out of memory error" Accept cash offer around £130 or might sell parts for spares if sufficient interest.

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VIC 20 & MOTHERBOARD and 16K Ram Super Expander Programmers Aid cartridge and joystick. £400 of s/w Offers please Tel Nottingham 289467

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CBM 64 games for sale, half price all originals Scramble Beseiged Music 64 Hobbit Hunchback Hover Adventures, Kick-off Maniac minor etc Tel Bristol 637517

CBM 1515 printer with paper 2 months old still guaranteed Tel 01-672 3656 Eves Mr Williams.

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VIC 20 Micro 48K Super Expander 15 Games include Panic £3.00 Catcha Snatcha £3 00 Butz/EEC £2 50 Books include Getting Acquainted Learn Computer Programming £5 Altogether Tel Otterly (040481) 3426 Mr Gifford

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CBM 64 S/W inc. Pakakuda. Hobbit Hunchback Kong, Attack of the Mutant Camels, Motor Mania and Who Dares Win £2 50 each or the lot for £15 Tel Northwood 26322

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VIC 20 SOFTWARE cartridges Voodoo Castle Avenger Road Race £6 50 each Cassettes, Injector Galaxions, £3 50 each Tel Dean 061-477 2718 evenings

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VIC 20 16K RAM pack for sale £25 or nearest offer Contact Allan after 4pm Tel 05762 2834 or write 4 Creamery Cottages Lockerbie Dumfriesshire

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VIC 20 AND TAPE recorder for sale Both still in the box Good condition Phone Burnwood 72950 after 5 30pm any day All for only £69 Will deliver if not too far

COMPUTER SWAP

COMPUTER SWAP

Computer Swap entries are limited to 30 words. Either fill in the accompanying form and send to Computer Swap *Popular Computing Weekly* 12-13 Little Newport Street London WC2R 3LD or telephone 01-437 4343

All software offered through computer swap must be in original condition and for private sale only

Warning: It is illegal to advertise pirated software

Please write your copy in capital letters on the lines below

Name

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Dragons for sale

DRAGON 64 boxed as new. Quickshot Joystick Light Pen Books s/w and mags. £180 o.n.o. Tel 01-449 7583 after 4 p.m.

DRAGON 32 under warranty immaculate condition 3 joysticks cover speech synthesiser cassette recorder books metercloth cartridge Dragon user mags, many games worth £440 sell for £230 Tel (0325) 718387

DRAGON 32 four months old + some mags and leads. Swap for 48K Spectrum or sell for £150. Write to 27 Bramber Road Chichester leeds Sussex or come and see it.

DRAGON 32 plus joystick. Good bene... £70 Tel 01 348 0374

DRAGON 32 joystick, manual, £90 of software books, magazines. Excellent condition sell for £160 worth over £275 Contact Rod on Swansea (0792) 401823 weekdays after 4 pm

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DRAGON 32 for sale. Lots of software light pen cassette etc £140 or exchange for other computer Spectrum etc. Cash adjustment if necessary 01-474 5846 Mark

DRAGON SOFTWARE for sale £72 worth of games including Ring of Darkness Pettigrew's Diary The King, etc. Nine in all £5 each or sale Ring Peter on 0780 810160 (after 6 p.m. please)

DRAGON 32, 2 joysticks a few books and magazines v.g.c. £100 o.n.o. or swap for issue 3 48K Spectrum. Tel. Kidderminster 753066.

DRAGON 32 boxed with joysticks and £230 of original software Chess Donkey King, etc. Could deliver in South Staffs/West Midlands area, £150 the lot. Phone Rugeley 6477

DRAGON 32 HOME COMPUTER, joystick, mags books games including Frogger Missile Command Cuthbert in the Mines + many more Boxed cost £280 £170 o.n.o. Tel. 0422 74596 Eves

DRAGON 32, joysticks new £260 of s/w light pen. £250 Tel 01-904 4185 Eves.

DRAGON Edit + Hi-Res Cartridge Amazing display utility £25 Lots of software cassette and Delta disk, sell/swap Centronics parallel P1 printer 30 40 80 sell £100 o.n.o. Tel 01-675 2958 day-eves 01-673 7877

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DRAGON 32 GC, still under guarantee + some S/W and literature £120 ono Peter 01 249 5876

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DRAGON 32, 4 months old under guarantee Mags, books, Frogger all leads etc Microdeal joysticks available or swap for PX CBM 64/C2N or sell £130 Tel Waterlooville 57826 (Hampshire eves)

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ACORN ATOM 12+12 excellent condition with software £75 the only computer to run BBC basic for less than £130 extra Memory with details free to buyer Tel 021 747 5084

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APPLE II Z-80 CARD U-Micro sensible offers IBM Golfball computer printer £85 o.n.o. Kim with manuals, £30 o.n.o. Colchester (0206) 43028

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ACORN ELECTRON guarantee excellent condition including £40 of s/w £170 o.n.o. Tel 021 449 0840 Eves

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BBC MODEL B O S 1.2 + Acorn DFS Absolutely unused Genuine reason for sale which I can explain by phone on Gloucester (0452) 422109 Offers over £440

BBC B' software, £180 worth Mostly Acornsoft Program Power Superior software also Hobbit Great bargain at £28 Tel Brighton 0273 604804

BBC disc owners Back-up All your software onto disc with DiscDoc. Disk to disc disc to tape Will even back up arcade software disk, £10 see at 01 848 4000 after 4pm. Private sale!

ORIGINAL S/W for sale 2 Acorn still inc. Meteors Cube Master £7 00 Kansas. ie Scramble, Swoop (program power) £4 50 plus Spectrum tape to Scrabble £10 Tel Erith 33474 for Guthrie

BBC 1 2 O/S Acorn DFS Rom expansion board with O/Doctor W/Wise graphics expansion Screen Dump Roms, Teac SS/80 40/80 switchable d/drive Epson FX 80 printer £1 000 Watford 46668

BBC MODEL B + double sided disc drive S/W boxed manual 8 months old £450 Tel 01-636 6080 Ext 221 (Day) (09328) 82342 (Eves) M Avery

For sale

TEXAS INSTRUMENT TI 99 4A As new Instruction Manual 1 three cartridges Intro to Basic cassette and cassette cable 29£ Tel (0442) 45800 Mr Ridnitz, after 6.30pm

RADOFIN TAD110 Teletext adaptor Teletext with any television receiving BBC2 Little used Boxed was normally £200 Only £120 ono Meredith Myears 25 Rona Road NW3 2HY 01-485 5054 after 6.30pm

VIXEN 16K Switchable Ram pack for Vic 20 (£20) and Spectrum 16K to 48K upgrade (£15) Both never been used. Tel N. Stokell on (0783) 44356 between 4pm and 5pm

TI 99-4A WITH twelve cartridges including Parsec and extended Basic. Also interface and joystick, forty cassettes, speech synthesizer boxed and manuals Accept £240 ono or will split. Tel Derby 0332 704003

SEIKOSHA GP100A Graphics Printer boxed and in excellent condition £140 Kempston Centronics interface for Spectrum boxed with software and instructions £15 Tel 01-894 6861

GAMES FOR SALE. Ocean Kong Arcadia and Push Off Will sell for £2 each or swap Tel Andy 061-489 8647 (after 6.30pm)

FTEXAS TI 99/4A extended Basic cartridge for sale Bargain at only £30 Phone Swindon 692123 after 6pm and ask for Derek.

ORIC 1 48K, Tape Recorder Xenon Defence Force Ultra, Star Fighter Flight Multigames and tape modification (very reliable loading) Manual, all leads, various articles £160 ono Tel Bourne (0778) 422164 after 6pm

CENTRONICS 737 2 Printer for sale Six character sets three character sizes Tractor and Friction feeds Sheet, roll and fanfold paper Excellent condition only £200 Phone Derek, Swindon 692123 after 6pm

LUNAR JETMAN, Moriel month the bears and cru s ng on Broadway £2 50 each Phone (021) 308 2064

SHARP MZ80K 48K and Hi-Res in built Monitor and cassette Xtal Basic. Structured Basic Basic extensions, integer Basic Compiler Sharp and Hisoft Pascal. Knight's Fortran £200 ono. Tel Medway 377756

48K LYNX. Perfect condition with 19 months guarantee remaining, sell for £138 or consider 48K Spectrum with peripherals taken for part exchange 01-337 2844 (Worcester Park)

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SHARP MZ-80A WANTED Interface unit and printer to suit MZ-80K Must be in good working order Tel Frank on 08324 237 (Peterborough)

FOR SALE. Siren City and Space Shuttle for CBM 64 Also CBM Joystick, all only used once £20 ono K. Morris, 48 Ashmead Drive Hardwick, Cambridge CB3 7XT

FOR SALE. Texas TI99 4A and cassette recorder with single cassette cable and five cassette games immaculate condition (computer boxed) £85 ono Tel. 061-881-6825 after 6pm ask for Room L5

TI99 4A with manuals, joysticks, all these including cassette leads and books, vgc Will swap for 48K Spectrum vgc + software Ring 0983 297215 after 6pm

TI 99/4A, cartridges, books, joysticks, and also cassette £100 ono or swap with any Spectrum Sharp MZ80K, 48K Lynx, Dragon Some educational software required but not necessary Tel 0789 206341 Quick!

TRS-80 software on cassettes All original, cost over £100 Utilities and games (Frogger Pyramid 2000 Backgammon etc) 14 cassettes in as new condition, Sacrifical First, £30 the lot (0244) 675717

LYNX 48K, very good condition plus leads, manual and home-made S/W £175 for quick sale Tel Batley (0924) 475281 after 5pm

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ALPHACOM 32 printer as new boxed much better than ZX printer Tel Oxford 770730

48K ORIC-1, boxed and still under guarantee with Fantasy Quest and Franklin's Tomb £90 ono Write to 2 Heswall Road Reddish Stockport Cheshire SK5 0SN Tel 061 432 9636

Wanted

WANTED Modulator lead to connect Tandy TRS 80 Mod 1 to TV set Please help £8 suggested? Norman 4 Westbourne road, Wallasey Merseyside L44 2EW

WILL SWAP ZX 81 PRINTER for Memotech Centronics I/F and cable or will buy Can anyone help me? Phone Chelmsford (0245) 263505 anytime Please urgent need this lead

WANTED ZX PRINTER AND PAPER. Good condition Swap for any attack gridrunner Mr Wimpey Knot in 3D 3D tunnel Phone Swindon (0743) 29745 after 6 pm to 9 pm Ask for Richard.

VIC 20 CARTRIDGES and cassettes for swap or sale Tel 0292 76493 (Derek)

SWAP SPECTRUM and Oric-1 software Phone 01 599 3815 and ask for Peter

SPECTRUM OWNERS Will swap our ultimate toolkit Including Ram Mover Trace Tape copier + many more! for your unwanted original software Offers + SAE to Wilson software 10 Whitebeam Drive Liverpool L12 0AV

ANT ATTACK wanted Will swap my original software for yours. Have adventure and arcade games plus Fortune Telling cassettes All 48K Spectrum Tel 051 355 8100 after 6pm. Local only

WANTED BACK ISSUE now Computer Gazette for Commodore Nov 1982. Will pay good price Tel 041 884 3129 after 5pm

SWAP 7 ORIGINALS Spectrum Games inc 3D-Tape Space, Horace + The Spiders etc. Worth £45 00 Good condition ZX Printer + paper Tel 01 228 3546 after 2pm.

SWAP HORACE and the Spiders, 4 discs Basic language Forth. Tel 01-902 1090 Darren After 7.30pm.

BBC S/W large range to swap Tel. Rayleigh (0238) 742898 anytime or send list for mine Paul, 37 South View Close Rayleigh Essex

WANTED!! INTERFACE to connect ZX Printer to BBC micro computer preferably through Centronics parallel port. Good phone printer may also be taken!! Contact R Vanni at Johnstone 24078 after 4pm (Glasgow)

WANTED! The Quill by Gilsoft, must be original and in new condition with all instructions etc Will pay £8 Write to R A Kidd 20 Buckfast Close Ipswich Suffolk.

SWAP ROUGH Rider Radio Trickle and Quick Chargers, batteries also

body and speed controller for 8-10 CBM 64 Games. Also Hip Hi-Fi for 3-4 CBM 64 games Tel: Camberley 82780 after 6pm

WANTED ATARI Cart Star Raiders Defender Centipede £10 French £15 16K tapes £5. Extra memory for 400 32 48K Phone Mark 0749 812232.

WOULD ANYBODY be interested in forming a poster club for the Spectrum Please write to R A Kidd 20 Buckfast Close Stoke Park, Ipswich, Suffolk, IP2 9BG. Giving any views also Tips

WANTED DISC DRIVE for CBM 64 Pay up to £ 50 Also VIC 20 + 84 games to sell. 01-658 8643.

VIC 20. Joystick, Recorder Super Expander Programmers Aid, 8K Ram Cartridge An assortment of games Cartridges. Mother Board To swap for spectrum 48K with accessories if available Tel 386 386 729

48K SPECTRUM with all leads Will pay no more than £80 Tel Camberley 33820

SWAP VIC 20 with 8K expansion + 2 cartridges — games for Aquarius with cassette unit — s/w Tel 69 45 491

WANTED Acorn or keyboard for Spectrum Swap for cordless phone very good range — auto dial, paging etc £100 Tel 0472 802445

CBM S/W to swap Tel 031 601 7477

ATARI 400 — 3 Rom cartridges and 1 cassette — swap for CBM 64 and cassette unit Tel Preston (0772) 792987

48K ZX SPECTRUM Any casing Any condition Tel Mead 0352 740 485

CBM 64 Disc based s/w or other Specialty games — Jiffies. Tel 01 574 4122 after 6pm

Diary

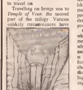
Event	Venue	Dates	Admission	Organisers
ZX Fair	Bolton Sports Centre Bolton Lancashire	May 12 10 00am-5 00pm	75p adults 50p children	Northern Premier Exhibitions 15 South Parade Pudsey West Yorkshire 0532 552854
Walthamstow 84	Main Exhibition Hall Waltham Forest Technical College Forest Road, London E17	May 19 10 00am-5 00pm	£1 00	Londex Exhibition and Promotions 36 Exeter Garden Ilford Essex 01-554 5039
Apple 84	Fulcrum Centre Slough	May 24-25 10 30am-5 30pm May 26 10 30am-4.30pm	£2 00 on sale (free tickets in advance from organisers	Database Publications, 68 Chester Road Hazel Grove Stockport 061-456 8383
North Wales Computer Fair	Memorial Hall Bodhyfryd Wrexham	May 26 10 00am-4 00pm	50p adults 25p children £1 00 family ticket	Granard Communications 4 Babmaes St London SW1 01-930 6711
Cetex (Consumer Electronics Trade Exhibition) (Trade only)	Earls Court	May 27 30 10 00am-7 00pm	Free	Montbuild Ltd 11 Manchester Sq London W1 01-486 1951
8th International Commodore Computer Show	Novotel Hammersmith London	June 7-8 10 00am-6 00pm June 9 9 00am-6 00pm	£2 00 adults £1 00 children £3 00 family ticket	Granard Communications, 4 Babmaes St, London SW1 01-930 6711

New Releases

SQUATTERS

Mountains of Ket seems to have built a tidy band of enthusiasts who have happily and doggedly trekked over the mountains to be double crossed by a Zombie and so forced to travel on.

Travelling on brings you to *Temple of Vran*, the second part of the trilogy. Various unlikely circumstances have



meant you were forcibly volunteered to find the Temple and kill off all its evil squatters. This lurches you into another adventure even more difficult than the *Mountains of Ket*.

Along with the usual adventure format of verb-noun-commands, there is a special combat screen which records the relative prowess, energy and luck of you and your opponents — of which there are all too many in the game.

If you liked the first part, I don't think you'll be taking much of a risk with this.

Program	*Temple of Vran*
Price	*£7.50*
Micro	*Spectrum*
Supplier	*Incentive Software, 54 London Street, Reading, RG1 4SQ*

UTILITY

The first program to be issued only on microdrive is Prosign's *Basic +*. As you might guess it is an extension to Basic. Uneventful perhaps, but in fact programming utilities are one of the most sensible things to have on Microdrive since they are a tool it is necessary to have them readily available.

Basic + contains a number of additions to the standard basic syntax including structured BBC type commands like *Repeat Until*, *Proc Defproc* and *If Then Else*. There are additions to the graphic commands like *Cursor* which simply moves the cursor to any given position x,y and *Draw to* which draws from the current cursor position to x,y.

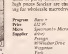
Other features are *Free* which tells you how much memory you have left, *Delete* which removes specified line numbers and *Renumber* which is self-explanatory. Although for a fairly basic utility it's not cheap at £12.95, this must I think he partly blamed on the high prices Sinclair are charging for wholesale microdrives.

Program	*Basic +*
Price	*£12.95*
Micro	*Spectrum (+ Microdrive)*
Supplier	*Prosign, 80 Windsor Drive, Wigginton, York, YO3 8YE*

COLD COMFORT

Demolator from Visions is a sophisticated arcade game for the BBC B. It uses sprite graphics, smooth scrolling and all the other current programming wizardry to produce a complex game.

Mankind is slumbering in cryogenic suspension, most of



it having been decimated in one of those historically inevitable burst of intergalactic violence that feature so often in science fiction.

You must defend the slumbering humans with a single robot called the Phobe. The range of baddies varies with what wave you are on, but suffice to say there are various kinds all capable of differing destruction.

BBC arcade addicts should have hours of fun with this one. *Demolator* will only work on the BBC B with the 1.2 operating system.

Program	*Demolator*
Price	*£6.95*
Micro	*BBC*
Supplier	*Visions, 1 Felgate Mews, Studland Street, London W6 9JT*

BRAIN DAMAGE

I G Programs is a new company who has entered the Commodore 64 market with a double game cassette entitled *Boxing/Galactica I*.

Boxing is a computer version of the complex and subtle sport for two players. Using either keyboard or joysticks two players electronically batter each other to a pulp as represented by two graphic boxers. A wholesome form of incipient brain damage.

The other game, *Galactica I*, has you defending yourself from a whole host of bounty hunters seeking to cash you in for a crime you did not commit. Crash Zap Pow.

Program	*Boxing/Galactica I*
Price	*£5.50*
Micro	*Commodore 64*
Supplier	*I G Programs, 23 Newall Tuck Road, Chippenham, Wiltshire, SN15 3NL*

HYSTERICAL

Desperate humour from Optima software whose *Bed Bugs* program came with a hysterical press release explaining knowingly how shocking the program was "revolting and obscene" apparently.

Actually, it is a pretty good arcade game in which you bash bedbugs with a jam sandwich or crunch them with your false teeth. Amiably gruesome as you try to tie your fingers in knots fighting the little devils off.

Program	*Bed Bugs*
Price	*£6.95*
Micro	*BBC/Electron*
Supplier	*Optima Software, 36 St Petersgate, Stockport, SK1 1HL*

SPEEDY

Petite Pascal is a thorough implementation of the structured language for the Dragon 32. In fact, it is one of only a few implementations of the language on the various micros.

The editor, compiler and source code are loaded in at once so that program execution speeds are fast — source code is compiled more quickly than it is listed.

The program contains a useful handbook outlining the main features of the program and providing a limited introduction to the language itself which is probably no more difficult than Basic.

Program	*Pascal*
Price	*£14.95*
Micro	*Dragon 32*
Supplier	*Oasis Software, Alexandra Parade, Weston super Mare, Avon*

New Releases

Pick of the week

EAST SIDE STORY

I wus framed, da boys did da dirdy on me an set me up wid da mob — I mean Rocco is a pursonal frien ob mine I luv da guy like a bruder and den da guy goes an get da hitman in from Detroit.

Da name Mugsy mey mean nuffink to vou now but you sure gonna learn it gud in da next few muunfs. Da tru word on wha really wen down in da istry of Mugsy is dere in da rich multicoloured tabestry dat is Mugsy da game by da Melbourne House mob, da ones who did dat fairy game wid da sus ys

Da game Mugsy have an dis is no lie da bes graphics eber seen on da Spectrum da tru admospear ob da East sibd is dere complete wid da dames in da funny hats an da real hard guys in da suits

As da player, you tell das boys what da split on da loot in terms of da hardware an da kickbacks an da protection, an try to survive in da sling and da arrers dat is da outrageous fortune of da gangland existence Dis be wher da gangland mettle ob da player is tested

Dis being a long statement I just cut da hole ding real short an say dat Mugsy is a real good game wiv real AI graphics

Program *Mugsy*
Price *£6 95*
Micro *Spectrum*
Supplier *Melbourne House*
131 Trafalgar Road
Greenwich
London SE10

SPECIFIC

The Spectrum has sold in such vast numbers that some of the programs being issued have markets which are astonishingly specific and limited — no bad thing, of course, providing the companies involved can still make some money

Placet Software has a program for people who fly model aeroplanes and who collect model engines (I didn't know anyone collected them) All the vital information like serial number engine type displacement prop size etc can be included in a large database

A curious program which is doubtless what someone somewhere has just been looking for One interesting point — it is written in Pascal using Hisoft Pascal compiler

Program *Engine Collector's*
Price *Catalogue*
Micro *£3 45*
Supplier *Spectrum 48K*
Placet Software
24 Marl Road
Radcliffe-on Trent
Nottingham
NG12 2GY

NEAT WALLET

D Base is an extremely powerful database program for the BBC with disc drives Some of its specifications are more commonly associated with business software on expensive micros

Like most databases you can keep, update and search through the files very quickly but this database allows for up to 199K worth of file (with an 80 track disc) In addition, field lengths are not set you can use a *Redefine* command to change them should you decide you need more room

There is even a simple database language of sorts using spreadsheet like formulae for the simple manipulation of mathematical figures for VAT etc The program comes in a neat wallet with an extensive manual

Program *B Base*
Price *£25 00*
Micro *BBC*
Supplier *Clares Micro Supplies*
98 Middlewich Road
Rudheath
Northwich
Cheshire
CW9 7DS

MUSIC MAESTRO

Multisound Synthesizer is the latest in a number of programs which facilitate use of the excellent sound chip in the Commodore 64

Of all the various packages available this one looks the most concerned with simply turning the 64 into a musical instrument rather than as a musical educator

The actual sound options are very sophisticated, including modulations and various sorts of filter effect Using the three channels background sound patterns and drum routines can be repeated up to 65 notes

Keyboard notes are visually displayed and to get you started there are eight pre defined drum routines You can store up to ten tunes in memory and by merging sections from tape create complex works In fact with this program all that stands between you and fame is a decent haircut

Program *Multisound Synthesizer*
Price *£14 99*
Micro *Commodore 64*
Supplier *Romik Software*
272 Argyll Avenue
Slough SL1 4HE

BAD PUNS

Haunted Abbey is the first of A&F's games to feature its new protection device designed by Jim Lamont

It was deliberately chosen as the first program to feature the new protection, because it was of sufficiently high quality to ensure that people would (hopefully) want to buy it rather than just copy it

The game is an adventure where you must find Phibe's Book of Incantations and collect treasure from an abbey The text is full of extremely bad puns and the kind of puzzles that keep Tony Bridges occupied for months

Program *Haunted Abbey*
Price *£7 90*
Micro *BBC*
Supplier *A&F Software*
Unit 8
Canalside Industrial Estate
Woodbine Street East
Rochdale Lancs

ADDICTED

Atari has finally released it's authentic version of *Pacman* for the Spectrum — indeed it is the company's first Spectrum release

And what you get is quite astonishingly accurate with even the sound effects derived from the Spectrum's pathetic bleeper sounding right

If you haven't yet got a version of the game and are one of those poor souls horribly addicted to the ludicrous thing this would be the one to get if it wasn't for the unbelievable price

Program *Pacman*
Price *£14 99*
Micro *Spectrum*
Supplier *Atari*
Retail stores

New Releases is designed to let people know what software is coming on to the market. If you have a new game or utility which you are about to release send a copy and accompanying details to New Releases, Popular Computing Weekly 12 13 Little Newport Street WC2R 3LD



Top 10

Spectrum*

1 (1) Jet Set Willy (Software Projects)
2 (3) Chequered Flag (Psion)
3 (5) Scuba Dive (Durell)
4 (–) Kong (Ocean)
5 (4) Hunchback (Ocean)
6 (7) Pogo (Ocean)
7 (9) Lunar Jetman (Ultimate)
8 (2) Atic Atac (Ultimate)
9 (10) Automania (Imagine)
10 (1) Bugaboo (Quicksilva)

All 48K
(Figures compiled by W H Smith and Son, London)

Atari

1 (1) Zaxxon (Datasoft)
2 (4) Rally Speedway (Adventure International*)
3 (6) Saga 6 The Count (Adventure International#)
4 (–) Solo Flight (Microprose#)
5 (3) Warlock (Calisto)
6 (2) Jinxy (Cosmi)
7 (–) Fire Fleet (English)
8 (–) Escape from Pulsar seven (Channel 8)
9 (–) A.C.E. (English)
10 (7) Savage Pond (Starcade)

* Cartridge ● 32K Cassette # 48K Disc

(Figures compiled by Calisto computers, Birmingham 021-632 4858)

Vic 20

1 (3) Flight 015 (Ferranti Davenport)
2 (4) Submarine Commander (Thorn/EMI)
3 (–) Tank Commander (Thorn/EMI)
4 (–) Tower of Evil (Thorn/EMI)
5 (–) Snooker (Visions)
6 (2) Krazy Kong (Interceptor)
7 (10) Grid Runner (Llamasoft)
8 (–) Megagalactic Llamas Battle at the Edge of Time (Llamasoft)
9 (10) Mine Madness (Thorn/EMI)
10 (8) Jet Pac (Ultimate)
(Figures compiled by Boots/Websters)

BBC*

1 (4) Fortress (Pace)
2 (–) Eagle's Wing (Software Invasion)
3 (8) Mr Wimpy (Ocean)
4 (9) Snooker (Visions)
5 (–) Adventure Quest (Level 9 Computing)
6 (7) Dambusters (Alligata)
7 (5) 3D Space Ranger (Microbyte)
8 (–) Spooks and Spiders (Software Invasion)
9 (–) Spectre (Program Power)
10 (–) Education II (Golem)
* All model B
(Figures compiled by Micro Management, Ipswich 0473 59181)

Commodore 64

1 (5) Hunchback (Ocean)
2 (10) Colossus Chess (CDS)
3 (6) Mr Wimpy (Ocean)
4 (–) Black Hawk (Thorn/EMI)
5 (–) Slurpy (Thorn/EMI)
6 (–) Space Shuttle (Microdeal)
7 (–) It's Only Rock and Roll (Microdeal)
8 (–) Introduction to Basic (Commodore)
9 (–) Falcon Patrol (Virgin)
10 (9) Revenge of the Mutant Camels (Llamasoft)
(Figures compiled by Boots/Websters)

Dragon

1 (8) Eightball (Microdeal)
2 (3) Chuckie Egg (A&F)
3 (2) Hungry Horace (Melbourne House)
4 (4) Ugh! (Softek)
5 (7) Kriegspiel (Beyond)
6 (10) Frogger (Microdeal)
7 (5) Pedro (Imagine)
8 (9) Up Periscope! (Beyond)
9 (–) Dragonfly 2 (Hewson)
10 (–) SAM (Peaksoft)
(Figures compiled by Boots/Websters)

ZX81*

1 (–) Krazy Kong (PSS)
2 (10) Chess (Psion)
3 (4) Scramble (Quicksilva)
4 (–) Football Manager (Addictive Games)
5 (3) Mothership (Sofsync)
6 (5) Flight Simulation (Psion)
7 (7) Space Raiders (Psion)
8 (9) Defender (Quicksilva)
9 (8) Invaders (Quicksilva)
10 (6) Asteroids (Quicksilva)
* All 16K.
(Figures compiled by Boots/Websters)

Books

1 Battle Games, Isaacson & Tyler (Usborne)
2 Space Games, Isaacson & Tyler (Usborne)
3 Commodore 64 Games Book, *Bishop* (Granada)
4 Games for Your ZX81 *Charlton* (Virgin)
5 91 Programs for Your Vic 20, *Erskine et al* (Pan)
6 Creepy Computer Games, *Erskine et al* (Usborne)
7 Easy Programs for the Commodore 64 *Stewart & Jones* (Shiva)
8 Commodore 64 Exposed *Bayley* (Melbourne House)
9 Commodore 64 Adventures, *Grace* (Sunshine)
10 80 Programs for the Spectrum, *Erskine et al* (Pan)
(Figures compiled by Estersias)

Book Ends

EXPENSIVE

Advanced Programming Techniques on the Electron is an excellent book, but is far too expensive

The book covers thoroughly proper programming techniques and contains a number of useful programs on a variety of subjects It is especially good on flow diagrams But the price — for a book that isn't even imported!

Book	*Advanced Programming Techniques on the Electron*
Price	*£8 85*
Micro	*Electron*
Supplier	*Addison — Wesley 53 Bedford Square London WC1*

BBC BASIC

Adventure into BBC Basic is another book in the seemingly unsaturatable (not BBC English) BBC Basic market, albeit with a slightly unusual approach

Using the design and development of an adventure as the linking theme, the book explains all the main features of BBC Basic including maths, sounds arrays, data and the rest

The various sections contain a number of experiments (which is another way of saying revision exercises) in which the main points can be tested

The adventure itself, finally revealed in all its glory (and length) at the end of the book looks fun and generally the book seems well presented and

Book	*Adventure into BBC Basic*
Price	*£6 95*
Micro	*BBC*
Supplier	*John Wiley Baffins Lane Chichester West Sussex PO191UD*

BOOLEAN

An interesting book for the (extremely) technically minded is *Digital Techniques* by D R Browning This book discusses the way computers deal with arithmetic and equally how arithmetic is used in computers

There are sections on Boolean algebra and the various kinds of gate — the book is initially intended for schools so there are various tests and exercises throughout.

Book	*Digital Techniques*
Price	*£2 95*
Micro	*General*
Supplier	*Longman House Burnt Mill Harlow Essex CM20 2JE*

This Week

Program	*Type*	*Micro*	*Price*	*Supplier*
Hopper	Arc	Aquarius	£8.95	Microdeal
The Adventures of Robin	Arc	Atari	£9.95	English
Battle Planet	Arc	BBC	£6.95	ISP
Haunted Abbey	Ad	BBC	£7.90	A&F
Chuckie Egg	Arc	Commodore 64	£7.90	A&F
Danger Ranger	Arc	Commodore 64	£8.00	Microdeal
Scope	Ut	Commodore 64	£17.95	ISP
Beam Rider	Arc	Dragon	£8.00	Microdeal
Crash	Arc	Dragon	£8.00	Microdeal
Hi Res	Ut	Dragon	£3.95	Orion
High Speed Dragon	Ut	Dragon	£3.95	Omega
Hogard	S	Dragon	£4.95	Orion
Buzzard Bait	Arc	Dragon 32	£8.95	Microdeal
Cuber	Arc	Dragon 32	£8.00	Microdeal
Electron	Arc	Dragon 32	£8.00	Microdeal
Galagon	Arc	Dragon 32	£8.95	Microdeal
Grabber	Arc	Dragon 32	£8.00	Microdeal
Machine Language Tutor	Ed	Dragon 32	£8.00	Microdeal
Centipede	Arc	Lynx	£8.95	Play It
Ciro	S	Oric	£3.95	Orion
Graffix	Ut	Oric	£7.95	Windmill
Story Book	Ed	Oric	£4.95	Softbacks
Chess II	Ed	Oric/Atmos	£9.95	Tansoft
3D Bat Attack	Arc	Spectrum	£6.95	Cheetahsoft
Arena 300	Arc	Spectrum	£6.95	Microdeal
Berzak	Arc	Spectrum	£6.95	Channel 8
Box 195	S	Spectrum	£2.00	Cheap Games
Character Enlarger	Ut	Spectrum	£4.95	Turtle
Character Enlarger	Ut	Spectrum	£4.95	Turtle
Character Generator	Ut	Spectrum	£8.00	Nalan
Conquest	S	Spectrum	£6.95	Cheetahsoft
Cricket Averages	Ut	Spectrum	£4.95	South Coast
Evil Realm & Bugout	Ad	Spectrum	£4.95	Turtle
Gold Swap	Arc	Spectrum	£5.75	Nalan
Pacman	Arc	Spectrum	£14.99	Atari
Rapid	Ut	Spectrum	£5.00	Esprit
Roadsafety	Ed	Spectrum	£4.95	Turtle
The Pied Pearl	Ad	Spectrum	£4.95	Astrosoft
Sheer Panic	Arc	Vic20	£6.95	Channel 8
Snackman	Arc	Vic20	£8.95	Microdeal
Flight	Arc	ZX81	£4.95	James Paton
3D Games	Arc	ZX81 1K	£5.95	I Thomson

Key **Ad** — adventure/**Arc** — arcade/**Ed** — education/ **S** — strategy-simulation/**Ut** — utility

This Week is a new section that covers all the new software coming on to the home micro market each week All suppliers should send details of their new programs to This Week Popular Computing Weekly 12 13 Little Newport Street London WC2R 3LD



Software registry

A glossy brochure recently flopped onto my desk The *TSR Software Registry* it announced Program Protection' Well software piracy must be one of the most intractable problems facing the industry at the moment so I opened it eagerly anticipating a solution I was met by a barrage of questions

Do you demanded the blurb own or produce software? Is piracy a constant worry? How easily could you prove your legal rights? Can you afford to forego assistence in this vital area of your activities from as little as £75 per program for a five year period of registration?

Sufficiently intimidated I read on Alas how easily are the hopeful disillusioned The Software Registry turned out to be as much of a solution to the piracy problem, as a sticking plaster on a broken leg

Not that that is obvious at first sight, however There are an awful lot of generalities in the promotional literature Strengthening legal protection for your software is not difficult — contact the Software Registry it proclaims "The Americans have an official software copyright register and the Japanese system is imminent Help stop the UK software industry from missing out — use the Software Registry

What it doesn't say is that using the registry won't give you any added legal protection as such and that the reason the Americans have an official register is because it is part and parcel of their copyright system

So what do you get for your £75? Apparently the registry offers an independent date verification and administration system to assist with establishing and maintaining the rights of software authors and owners

Still no wiser? Well basically you give them a copy of your program and they store it for you If later on you get mixed up in a court case and need to prove when you invented your program the registry will provide an affidavit verifying the date it came into their hands (At a price however The registry charges £23 for its affidavit service)

Cynics among you may have already noticed that much the same end can be achieved, for a fraction of the cost by posting a copy of your program to yourself by registered delivery, and storing it unopened (If and when needed an affidavit can always be prepared by the solicitor who — by the time you get to court — you almost certainly have working for you And probably for less than £23)

But the *TSR Software Registry* has two other strings to its bow Firstly it makes much of the deterrent effect It claims that the very fact of registration can act as a deterrent to piracy of your software Why? Because (via a notice on the program which states that it is registered) it "shows that you have given sufficient consideration to your legal rights to gather together information which can be verified by an independent organisation in the event of litigation being necessary Hmmm I can't imagine the average pirate would be any more deterred by that than by the copyright notice how commonly included on most software True the fact that registration automatically includes legal insurance cover, might cause his or her hand to shake momentarily but the canny among them will quickly sus out that this TSR policy offers strictly limited protection

Which brings me on to their second rather fraying bowstring The cost of registration also includes some legal expenses insurance, but — as with all insurance policies — it's what it doesn't cover that matters Excluded is protection for disputes over ownership of the copyright — and remember other than in straight tape to tape copying most defendents will claim that theirs is a different program one which is their own original work and — an even more serious omission — Interlocutary actions

That means injunctions and the mysterious, but ever so-useful Anton Piller orders, under which copies of disputed programs can be seized As any reader of the press will rapidly realise most copyright actions only ever go as far as the interlocutary stage anyway (which can cost around £12 000 £15 000) To cap it all you — the insured — have first to pay a lawyer to prove to their — the insurers — satisfaction that you have good case!

What the software registry does prove is that it pays to read things carefully — and to ask yourself just what you are getting whenever someone offers you a panacea

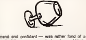
Gail Counsell

Just a nip

Puzzle No 106

Sir Solomon Sparrow of Merridew Hall was justly proud of his fine bottle of best quality brandy 'Just the thing to keep for Christmas' he remarked one fine spring morning

Unfortunately he had failed to take into account the fact that Christmas was still a long way off and also that Algernon — his closest



friend and confidant — was rather fond of a tipple When no one was looking he would help himself to a nip of brandy, and then top up the bottle to the original level with water

It was not until some considerable time later that these goings-on were discovered and by then it was too late The brandy was ruined and Algernon himself could no longer bring himself to drink it! In fact half of it — or as near half as makes no difference — had been replaced by water?

How many visits had to the brandy had Algy made if each 'nip' measured just 10 millilitres?

Solution to Puzzle No 101

The following program tests all possible values of *A* and *B* Both *A* and *B* must lie in the range 32 to 99 as they have 4 digit squares

```
10 FOR A = 32 TO 99 20 FOR B = 32 TO 99 30 LET A$ = STR$ A 40 LET B$ = STR$ B 50 LET C = A * A 60 LET C$ = STR$ C 70 IF C$(3)<>B$ (2) THEN GOTO 150 80 D = B * B 90 D$ = STR$ (D) 100 IF D$ (4)<>A$ (1) THEN GOTO 150 110 E = A * B 120 E$ = STR$ E 130 IF E$ (1)<>D$ (1) OR B$ (4)<> C$ (1) THEN GOTO 150 140 PRINT A,B 150 NEXT B 160 NEXT A
```

There are three possible answers but the value of *A* remains the same Thus *A* = 69 and *B* can equal 56 66 or 76

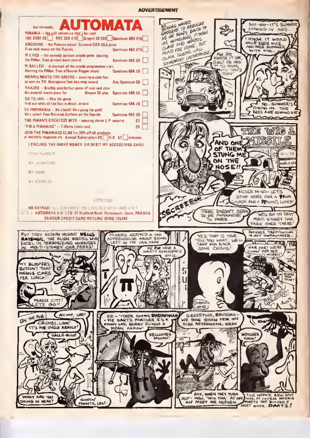
Winner of Puzzle No 101

The winner is J Gough Drummond Street, Enderby, Leicester, who receives £10

Rules

If the puzzle can be sensibly solved using a computer then the winner will have included a listing of the program used to find the correct answer The closing date for entries to Puzzle No 106 is May 25

The Hackers



AUTOMATA
PIMANIA — the cult adventure that's for real!
16K ZX81 £5 BBC 32K £10 Dragon 32 £10 Spectrum 48K £10
GROUCHO — the Pimania sequel. Concord-QE2 USA prize
Free rock music on the flipside Spectrum 48K £10
PI EYED — the comedy cartoon arcade game starring the PiMen. Free protest disco record Spectrum 48K £6
PI BALLED — A triumph of the arcade programmer's art. Starring the PiMen. Free offensive Reggae music Spectrum 48K £8
MORRIS MEETS THE BIKERS — exciting arcade fun as seen on TV. Outrageous free doo-wop record Any Spectrum £6
YAKZEE An oriental masterpiece for Dragon 32 plus Spectrum 48K £6
GO TO JAIL — Play the game Spectrum 48K £8
OLYMPIMANIA — He's back! He's going for gold! Free National Anthem on the flipside Spectrum 48K £6
THE PIMAN'S GREATEST HITS — amazing stereo L P cassette £5
"I'M A PIMANIAC" — T-Shirts (state size) £5
JOIN THE PIMANIACS CLUB for 20% off all products
pi monthly magazine etc Annual Subscription £9 U.K £7 overseas
I ENCLOSE THE RIGHT MONEY OR DEBIT MY ACCESS/VISA CARD
CARD NUMBER
MY SIGNATURE
MY NAME
MY ADDRESS
NO EXTRAS!
AUTOMATA U K LTD 27 Highland Road Portsmouth, Hants. PO4 9DA
24-HOUR CREDIT CARD HOTLINE (0705) 735242
HAVING WAVED GOODBYE TO GROUCHO AS HE ROWS BACK TO HIS HOMELAND, PIMAN CLAIR AND MORRIS HEAD FOR HOME. BUT CLAIR SEEMS STILL SOMEWHAT LACHRYMOSE.
AW DO KNOCK IT OFF, GIRL! HE HAD TO GO HOME, AND THAT'S THAT!
BOO-HOO-IT'S SUMMER COMING IN AND-
I KNOW IT WOULD HAVE BEEN NICE, ANOTHER SUMMER WITH HIM-
NO- SUMMER'S COMING IN- THE BEES ARE COMING OUT
THE WIG & MISSILE
AND ONE OF THEM STUNG ME ON THE NOSE!!
SSCREEECH
NEVER MIND- LET'S STOP HERE FOR A PINA COLADA AND A PIMAN'S LUNCH!
THERE DOESN'T SEEM TO BE ANYWHERE TO PARK-
WE'LL GO IN THAT MULTI STOREY CAR PARK OVER THERE!
BUT THEY RECKON WITHOUT HELLS RATBAGS, THE ALIEN BIKERS WHO EXCEL IN TERRORIZING MORRISES IN MULTI-STOREY CAR PARKS!
MY BLOOPER'S BUZZIN'! THAT MEANS CARS FER LUNCH!
MUNCH CITY! LET'S GO!!
MORRIS SEEMED A TAD APPREHENSIVE ABOUT BEING LEFT IN THE CAR PARK
HE DID HAVE A NASTY EXPERIENCE ONCE
YES THAT IS TRUE TELL YOU WHAT WE'LL TAKE HIM BACK SOME CRISPS!
MORRIS TREPIDATION IS NOT UNFOUNDED
HAR HAR! WE'RE COMIN' FER YER MORRIS!
HELLS RATBAGS
KERUNCH!
IN THE PUB
AYOOP, LAD!
CRUMBS, LOOK! IT'S ME UNCLE ARNOLD!
HALLO-ALLO!
WHAT ARE YOU DOING IN HERE?
SOOPIN' PAINTS, LAD!
EE- 'ITHER COOMS RASTAPIMAN - ME DARTZ PARTNER E'S A FOONY LAD, BURRY FLINGS A MEAN ARROW!
HELLOOYEH MWAN!
SONY
GREEETINZ, BRUDDAH - WE GON SHOW DEM OFF DISH AFTAHNOON, OKAY
WOTCHER COCK!
AYE, WHEN THEY TURN OOP- NOW, 'OIK THA AT OFF AN' MEET ME NEPHEW
THIS WEEK'S SELL SPOT WAS, OF COURSE MORRIS MEETS THE BIKERS!!
NEXT WEEK DARTZ!